4.0 ENVIRONMENTAL ANALYSIS

The environmental consequences of constructing and operating the Ruby Pipeline Project would vary in duration and significance. Three levels of impact duration were considered: short-term, long-term, and permanent. Short-term impacts generally occur during construction with the resource returning to preconstruction condition within 3 years following construction. Long-term impacts require anywhere from an estimated 3 to 50 years to return to preconstruction conditions. Both short- and long-term impacts are considered temporary impacts. Permanent impacts would occur as a result of activities that modify resources to the extent that they would not return to preconstruction conditions within 50 years, such as clearing of old growth forest or conversion of land to an aboveground facility site. We considered an impact to be significant if it would result in a substantial adverse change in the physical environment or natural condition.

In this section, we discuss the affected environment, general construction and operational impacts, and proposed mitigation for each resource. Generally, we begin our discussion of potential impacts for a given resource with what could happen in the absence of appropriate construction techniques or conservation measures to address environmental impacts or effects to resources. Our discussion then focuses on what we anticipate the impacts to be, given the project-specific factors and measures that would address environmental concerns, including measures proposed by Ruby, those required by other agency permitting or regulation, and our additional recommendations. For example, Ruby, as part of its proposal, agreed to implement certain measures to reduce impacts, and we evaluated the proposed mitigation measures and in some cases identified additional mitigation measures which we believe would further reduce impacts. The additional mitigation measures that we have identified **appear as boldface type in the text**. We are recommending that these measures be included as specific conditions to any Certificate that the Commission may issue to Ruby for the proposed project.

Conclusions in this EIS are based on our analysis of the environmental impact and the following assumptions:

- Ruby would comply with all applicable laws and regulations;
- the construction and operation work areas would be limited to the areas described in this EIS and the facilities would be constructed using the techniques described in this EIS; and
- Ruby would implement the mitigation measures identified in its application and supplemental filings to the FERC.

4.1 GEOLOGY

4.1.1 Geologic Setting

The Ruby Pipeline Project would be located within three main geologic regions:

- the Wyoming Basin (Rocky Mountain Division) of southwestern Wyoming (about 8 miles of the pipeline route and one compressor station);
- the Middle Rocky Mountains (Rocky Mountain Division) of southwestern Wyoming and north-central Utah (about 95 miles of the pipeline route); and

- the Basin and Range (Intermontane Plateaus) of north-central Utah, northern Nevada, and south-central Oregon (about 575 miles of the pipeline route and three compressor stations).

Topographic relief along the project ranges from nearly level across large basins to rolling hills with localized sections of very steep relief across several mountain ranges. Elevations along the proposed pipeline route range from a maximum of about 8,950 feet above mean sea level near the Cache and Rich county line in Utah to a minimum of about 4,039 feet in Humboldt County, Nevada. The elevation at the start of the project near Opal, Wyoming is 6,864 feet and the elevation at the terminus of the project near Malin, Oregon is 4,163 feet.

In Wyoming, elevations along the project route vary from 6,463 feet to 7,982 feet, and topography is generally moderate with localized areas of steep relief. In Utah, elevations along the project route vary from 4,222 feet to 8,950 feet, with the topography in the eastern portion of the state being generally moderate with localized areas of steep relief. In the central and western portions of Utah, topography is generally flat with localized areas of moderate relief. In Nevada, elevations along the route vary from 4,039 feet to 7,690 feet, exhibiting generally moderate topography with localized areas of both flat and steep relief. In Oregon, elevations along the project route vary from 4,121 feet to 6,709 feet, with generally moderate topography. Table 4.1.1-1 identifies locations along the proposed route where the pipeline would ascend or descend steep topography (*i.e.*, slopes greater than or equal to 15 percent).

Frequently, temporary extra workspaces are needed in areas of steep slopes and side slopes. Extra workspaces also are generally needed at wetlands, waterbodies, roads, railroads, and foreign pipelines/utilities. Prior to the issuance of the draft EIS Ruby filed information with the FERC that identified proposed temporary extra workspaces and staging areas. Ruby's filing attempted to provide justification for the use of these areas. Ruby has since updated its proposed extra workspaces and staging areas and also identified the need for water appropriation sites. Included with this update were many changes to the temporary extra workspace sizes and locations without specific justification for most of them. Because Ruby has not provided adequate (or any) justification for many of those workspaces, **we recommend that Ruby restrict the use of temporary extra workspaces to those locations identified as "Conditionally Approved for Use" in table E-1, Appendix E of this EIS.**

We note that Ruby has committed to setting extra workspaces back from wetlands, waterbodies, playas, forested riparian areas, areas identified as complex cryptobiotic soil crusts, and other sensitive locations. These commitments apply to the above workspaces and staging areas conditionally approved for use on this project. We also note that Ruby's plan (section IV.A.2) already allows expanding the right-of-way width by up to an additional 25 feet to ensure safe construction where required by topographic conditions (such as side slopes) or soil limitations; to accommodate full construction right-of-way topsoil segregation; and for truck turn-arounds. Any temporary extra workspace (not including staging areas or water appropriation sites) approved for use on this project is predicated on the workspace overlapping (not abutting) any expanded right-of-way width. If Ruby identifies a need for additional work areas, Ruby could request Commission approval of such work areas in writing, consistent with its Plan (section IV.A.1). The acreages in this EIS are based on Ruby's proposals to use all workspaces, staging areas and water appropriation sites in Appendix E. Our recommendation above, however, would require Ruby to file additional justification before use of the workspaces identified in Appendix E.

TABLE 4.1.1-1

Locations Where the Pipeline Would Ascend or Descend Steep Slopes

State/MPs	Approx. Length (ft)	Elevation Change (feet)	Percent Slope
WYOMING			
26.0 - 26.1	500	160	32%
29.0 - 29.2	1,000	280	28%
37.0 - 37.3	1,500	280	19%
40.0 - 41.0	5,300	920	17%
R42.5 - 42.7	1,000	160	16%
45.0 - 45.2	1,000	160	16%
46.8 - 46.9	1,000	160	16%
Subtotal	**2.1 miles**		
UTAH			
59.5 - 59.6	500	200	40%
60.0 - 60.2	1,000	240	24%
60.5 - 60.8	1,500	280	19%
60.8 - 60.8	500	160	32%
61.8 - 62.0	1,500	320	21%
62.0 - 62.2	1,000	280	28%
62.5 - 62.9	2,000	400	20%
63.5 - 63.9	2,000	400	20%
64.3 - 64.3	500	160	32%
65.0 - 65.2	1,000	160	16%
66.0 - 66.2	1,000	280	28%
67.3 - 67.4	1,000	160	16%
72.5 - 73.0	2,500	520	21%
74.5 - 75.1	3,000	800	27%
75.5 - 75.8	1,500	240	16%
R76.5 - 76.9	2,000	360	18%
77.0 - 77.2	1,000	240	24%
77.5 - 77.7	1,000	200	20%
77.8 - 77.9	1,000	200	20%
82.0 - 82.2	1,000	200	20%
84.0 - 84.2	1,000	160	16%
85.3 - 85.4	1,000	240	24%
87.0 - 88.0	5,300	1,080	20%
88.0 - 89.0	5,300	960	18%
89.8 - 89.9	1,000	200	20%
91.0 - 92.0	5,280	1,040	20%
93.0 - 93.2	1,000	400	40%
93.5 - 93.6	500	200	40%
93.5 - 93.6	500	200	40%

TABLE 4.1.1-1

Locations Where the Pipeline Would Ascend or Descend Steep Slopes

State/MPs	Approx. Length (ft)	Elevation Change (feet)	Percent Slope
93.8 - 93.8	500	160	32%
94.5 - 94.9	2,000	400	20%
95.0 - 95.4	2,000	520	26%
95.5 - 95.7	1,000	200	20%
97.0 - 97.7	3,500	560	16%
97.5 - 97.7	1,000	160	16%
98.8 - 98.9	1,000	240	24%
100.8 - 101.1	2,000	360	18%
101.0 - 101.6	3,000	1,080	36%
102.0 - 102.4	2,000	360	18%
102.3 - 102.4	1,000	240	24%
103.8 - 103.9	1,000	240	24%
104.8 - R105.1	2,000	440	22%
143.5 - 143.8	1,500	400	27%
145.3 - 145.4	1,000	240	24%
158.0 - 158.7	3,500	800	23%
229.0 - 230.0	5,300	800	15%
230.3 - 230.4	1,000	160	16%
Subtotal	**15.5 miles**		
NEVADA			
231.0 - 231.8	4,000	600	15%
233.8 - 233.9	1,000	240	24%
234.8 - 234.9	1,000	160	16%
236.0 - 236.2	1,000	240	24%
245.5 - 245.8	1,500	280	19%
254.5 - 254.8	1,500	240	16%
273.3 - 273.6	2,000	320	16%
273.8 - 273.9	1,000	160	16%
274.5 - 275.0	2,500	440	18%
281.0 - 281.3	1,500	240	16%
281.5 - 281.7	1,000	200	20%
284.0 - 284.9	5,000	760	15%
285.0 - 285.1	500	200	40%
286.0 - 286.1	500	160	32%
307.3 - 307.4	1,000	200	20%
316.0 - 316.4	2,000	320	16%
316.5 - 316.9	2,000	400	20%
317.3 - 317.4	1,000	160	16%
318.3 - 318.4	1,000	240	24%

TABLE 4.1.1-1

Locations Where the Pipeline Would Ascend or Descend Steep Slopes

State/MPs	Approx. Length (ft)	Elevation Change (feet)	Percent Slope
318.5 - 318.7	1,000	160	16%
322.5 - 322.7	1,000	200	20%
322.5 - 322.7	1,000	160	16%
343.0 - 343.1	500	160	32%
345.8 - 345.9	1,000	280	28%
346.3 - 346.4	1,000	320	32%
346.5 - 346.8	1,500	320	21%
347.0 - 347.5	2,500	680	27%
348.0 - 348.3	1,500	320	21%
348.8 - 349.1	2,000	400	20%
349.0 - R349.8	4,000	920	23%
R350.0 - R350.3	1,500	440	29%
R351.0 - R351.6	3,000	680	23%
R355.0 - R355.2	1,000	280	28%
R355.0 - R355.2	1,000	160	16%
R358.0 - R358.2	1,000	240	24%
R358.8 - R358.9	1,000	160	16%
R363.0 - R363.2	1,000	200	20%
R364.0 - R364.2	1,000	160	16%
R371.8 - R371.9	1,000	200	20%
R384.5 - R384.7	1,000	160	16%
416.5 - 416.7	1,000	160	16%
419.0 - 419.4	2,000	440	22%
444.0 - 444.5	2,500	480	19%
444.5 - 444.9	2,000	400	20%
484.3 - 484.4	1,000	160	16%
485.3 - 485.4	1,000	160	16%
501.3 - 501.3	500	160	32%
506.0 - 506.7	3,500	560	16%
510.5 - 510.7	1,000	200	20%
511.5 - 511.6	750	240	32%
513.5 - 513.6	500	200	40%
514.0 - 514.7	3,500	1,080	31%
517.8 - 518.0	1,500	560	37%
518.8 - 518.9	1,000	240	24%
520.5 - 521.0	2,500	480	19%
521.5 - 521.7	1,000	280	28%
526.8 - 526.9	1,000	240	24%
528.5 - 528.8	1,500	280	19%

TABLE 4.1.1-1

Locations Where the Pipeline Would Ascend or Descend Steep Slopes

State/MPs	Approx. Length (ft)	Elevation Change (feet)	Percent Slope
529.5 - 529.9	2,000	320	16%
532.3 - 532.5	1,500	320	21%
R538.8 - R538.9	1,000	160	16%
540.5 - 540.9	2,000	440	22%
543.8 - 544.0	1,500	240	16%
572.5 - 573.0	2,500	560	22%
574.3 - 574.4	1,000	200	20%
Subtotal	**18.9 miles**		
OREGON			
588.3 - 588.4	750	320	43%
588.5 - 588.6	500	280	56%
609.8 - 609.9	1,000	160	16%
610.5 - 611.1	3,000	600	20%
611.5 - 611.9	2,000	400	20%
613.0 - 614.0	5,300	1,000	19%
614.3 - 614.4	1,000	200	20%
634.8 - 634.9	1,000	160	16%
635.8 - 635.9	750	240	32%
637.3 - 637.4	1,000	240	24%
639.8 - 639.9	1,000	280	28%
R666.5 - R667.0	2,500	840	34%
R668.5 - R668.7	1,000	160	16%
R670.5 - R670.8	1,500	600	40%
R671.5 - R671.7	1,000	360	36%
Subtotal	**4.4 miles**		
Grand Total	**40.9 miles**		

Subsurface materials vary along the project route. The project would cross a large number of geologic formations and features ranging in age from Paleozoic (542 to 251 million years ago) to Quaternary (1.8 to 1.6 million years ago). Unconsolidated Quaternary-age sedimentary deposits such as alluvial, glacial, fluvial, lacustrine, and eolian deposits cover approximately 30 percent of the project area. Tertiary-age (56 to 1.8 million years ago) volcanic rocks such as tuff, basalt flows, and rhyolite cover approximately 27 percent of the project area. Paleozoic to Tertiary-age sedimentary rock such as sandstone, limestone, dolomite, and shale cover approximately 43 percent of the project area. A summary of general geologic conditions along the proposed project route is presented in table 4.1.1-2.

TABLE 4.1.1-2

Geologic Conditions Crossed by the Ruby Pipeline Project

Approximate MP Range	State	Description of Bedrock Formations Crossed
0 to 48	Wyoming	Mesozoic- and Cenozoic-age sedimentary rock with unconsolidated Quaternary-age alluvial sediments.
48 to 230	Utah	Paleozoic- to Cenozoic-age sedimentary and volcanic rock with unconsolidated Quaternary-age alluvial, glacial, eolian, and lacustrine sediments.
231 to 588	Nevada	Paleozoic- to Cenozoic-age sedimentary and Cenozoic-age volcanic rock with unconsolidated Quaternary-age alluvial and colluvial sediments.
588 to R672.6	Oregon	Cenozoic-age sedimentary and volcanic rock with Quaternary-age unconsolidated alluvial, glacial, eolian, and lacustrine sediments.

4.1.1.1 General Impacts and Mitigation

Over the majority of the project route, construction would result in the temporary disturbance of the natural topography due to grading and trenching activities. Ruby would restore surface contours and drainage patterns as closely as possible to preconstruction conditions following completion of construction. Ruby anticipates that blasting may be necessary where hard, non-rippable bedrock occurs and where it would be necessary to fracture surface rock during grading activities. Ruby has preliminarily indicated that blasting may be required in various places in Utah, Nevada, and Oregon from MP 57.5 to the end of the project. Blasting may be necessary where rock outcrop is present or where shallow soils are underlain by bedrock. Ruby would blast only where the rock could not be economically excavated by conventional means.

We received comments regarding the potential for the Vya Construction Camp and Lakeview Temporary Housing Facility to impact topography. The Vya camp is located approximately 6 miles west of MP 558 in Washoe County, Nevada. The Lakeview facility is located just west of the city limits of the Town of Lakeview, in Lake County, Oregon. Construction, operation, and decommissioning of the Vya camp and Lakeview facility would result in the temporary disturbance of natural topography due to minor grading activities. Ruby would restore surface contours and drainage patterns as closely as possible to preconstruction conditions following completion of construction. No specific sensitive or problematic geologic conditions or settings were identified at these locations. Based on the geologic setting and the proposed construction, the Vya camp and Lakeview facility are expected to have only temporary, short-term impacts on geologic resources.

4.1.1.2 Blasting

Blasting could potentially damage water wells, springs and seeps, undiscovered paleontological resources, unstable slopes, adjacent pipelines, buried utilities, and nearby structures. Potential damage to wells and springs/seeps is discussed in section 4.3.1.5. Potential damage to undiscovered paleontological

resources is discussed in section 4.1.4. Potential damage to unstable slopes, adjacent pipelines, buried utilities, and nearby structures is discussed below.

Ruby would comply with all state and federal regulations governing the use of explosives. Ruby developed a Blasting Plan (Appendix N) that would be implemented during construction. The plan includes the following information:

- identification and compliance with applicable blasting regulations;
- provisions for pre-blast geotechnical investigations;
- determination of appropriate charge type, weight, and configuration;
- depth and spacing of charges;
- detonation delays;
- procedures for notifying and evacuating nearby residents;
- procedures for pre- and post-blasting monitoring; and
- blast mat placement.

To address concerns associated with blasting on unstable slopes, Ruby's Blasting Plan requires that blasting be conducted and monitored by a licensed blaster. The blaster would be responsible for planning the shot pattern and load to account for site-specific geologic conditions and to minimize or eliminate any ground cracking (overbreak). During blasting, the blaster would monitor the area to determine if the blast caused any kind of ground displacement or overbreak. These measures would reduce the risk of slope failure in areas of elevated landslide incidence.

To minimize damage to adjacent pipelines and buried utilities, Ruby would not blast within 10 feet of an adjacent pipeline or buried utility. Where pipelines or utilities are within the work area and more than 10 feet away, Ruby would contact the pipeline or utility owner prior to blasting and would take measures to complete blasting so that the activity would not cause damage. Where aboveground structures are within 200 feet of the right-of-way, Ruby would request authorization from landowners to inspect the structures before and after blasting, monitor blasting effects (peak particle velocity [PPV] and decibel readings) at nearby structures, and protect structures from potential fly rock by using blasting mats or soil padding on the right-of-way. Ruby would evaluate and monitor areas adjacent to blasting to assess potential hazards to people or property. Ruby would be responsible for repairing any damages sustained through blasting and/or compensating the landowner.

Blasting is conducted with two goals in mind: 1) fragmentation of rock to sizes suitable for removal from the trench, while 2) minimizing effects to nearby features and people. Fragmentation estimates are based on the strength of the rock. Effects on nearby features and people are governed by a "design" PPV. PPV is a measurement of vibration at a given location. Vibration can cause varying degrees of damage to structures and affect personal comfort and safety. PPV is controlled by the amount of explosive agent used in a blast. A typical blast design calculation is iterative. The first step is to calculate the amount of explosive agent that can be placed into a conventional blast hole drilled to the appropriate depth for the requirements of the excavation. The second step is to calculate the spacing between blast holes needed to fragment the rock in the shape of the trench. The third step is to calculate the PPV generated by detonation of the explosive agent at a relevant distance to important features, such as a nearby well, spring, or underlying cavern. If the PPV exceeds a specified level, then the diameter of the blast holes or the time between detonating successive blast holes is modified and the PPV is calculated again. In this way blasting is "designed" so that a specified PPV at a particular distance is not exceeded during the process of achieving suitable fragmentation of the rock.

We received several comments during the draft EIS comment period concerning damage to rock cliffs, rock outcrops, and "rim-rock" from blasting and grading activities during pipeline construction. Exposed rock would be removed by a variety of methods to achieve a depth sufficient for pipeline burial. To the extent possible, Ruby has sited its pipeline alignment to avoid rock cliffs and rock ledges. However, Ruby has identified two areas where construction through exposed rock is inevitable; one 10- to 15-foot nearly vertical rock face on the south side of Twelvemile Creek (near MP 588) and one 30- to 35-foot nearly vertical face of lava flow located 2.5 miles southwest of Will Valley Reservoir on the South Langell Valley Route Alternative (near MP R653). Ruby would blast or rip a trench through the rock walls at these two locations to a depth sufficient to bury the pipeline. Padding material or rock shield would be placed around the pipeline prior to backfilling the trench with native material to create a more stable angle of repose. In areas where rock would be removed for construction the loss of the resource would be considered permanent.

The BLM has noted that the terrain from about MP 509 to 547 is particularly severe. The landscape is dissected by drainages that are often very steep and with bedrock very near the surface. The BLM believes that pipeline construction in this environment likely would be difficult and would produce greater than normal disturbance, and that the terrain would be difficult to restore and reclaim. The BLM further asserts that some of the existing access roads proposed for use in this area are narrow and would not be able to accommodate construction traffic without improvement, and that improvements would be impossible without substantial blasting to remove large constraining rock outcrops to achieve the 30-foot-wide roadbed required by construction equipment and vehicles.

As discussed in section 2.2.1, Ruby does not know exactly how or where road improvements would be required along any given road. This information would not be available until after Ruby's construction contractor identifies which roads it prefers to use and how it prefers to use the roads. We note that Ruby would not need to widen all roads to 30 feet; rather, a 30-foot width would be needed only in certain areas to accommodate sharp turns or where a passing lane is desired. Ruby has agreed to restore all roads to their preconstruction condition, except where the landowner has requested that the improvements be left in place. Blasting would result in permanent, irreversible improvements to roads in many cases. Therefore, Ruby would be required to obtain landowner approval prior to blasting for these road improvements. The BLM has indicated that all BLM-administered roads in Humboldt and Washoe counties (MPs R396.7 to 588.2) would be required to be restored to their preconstruction condition. This requirement could eliminate certain proposed access roads from being used on the project.

We received comments during scoping about the potential for blasting to cause a collapse of earthen dams and trigger seismic events. Geotechnical assessments by Ruby's geologic consultant, MACTEC, have indicated that structural impacts could range from 5 to 20 feet from the blast. No dams have been identified within the construction workspace and none would be located within the 20-foot maximum blast impact area for structures; therefore, dams are unlikely to be affected by blasting. Furthermore, the level of blasting anticipated for the project would be smaller in scale than the blasting that takes place for regional mining operations. Blasting associated with mining operations in the region has not triggered seismic events; therefore, project blasting should not affect the area's seismic setting.

4.1.2 Mineral Resources

Generally, exploitable mineral resources identified in the project area include oil and gas, coal, precious and semiprecious stones, ores, salts, stone, sand and gravel, and clay. The locations of these resources were determined by aerial photo review, database searches, literature review, topographic map review, and a limited field survey. Table 4.1.2-1 identifies areas of both active and inactive mineral resource production and locations of known mineral prospects in the project area. Additional resources may be identified during Ruby's preconstruction surveys and through interviews with property owners.

4.1.2.1 Mining

Table 4.1.2-1 identifies 58 sand and gravel pits; rock, mineral, and ore quarries; and coal fields within 1,500 feet of the area. Additionally, mining prospects have been identified in Nevada (MP 275.9 and MPs 506.7 to 518.3) within 1,500 feet of the project. Three coal fields and one potential rock quarry in Wyoming, one gravel pit in Utah, a gravel pit and borrow pit in Nevada, and a former gravel pit in Oregon have been identified within the construction work area.

The construction and operation of Ruby facilities near or over mines and exploitable mineral resources could impact the present and future extraction of those resources by impeding traffic access to mines during project construction and by restricting future mining within the right-of-way following construction. Access to mining areas during pipeline construction would create a short-term impact. Ruby has committed to coordinating construction with mine owners in the project area to determine whether alternative access routes to the mines are available or to determine if construction could be timed to minimize interference with mine traffic in the vicinity. Where necessary, Ruby would provide mine operators access across the project area during construction. The construction of the pipeline over mineral resources would create a permanent impact, as these mineral resources directly under the permanent right-of-way would become irretrievable for future mining operations. Ruby is presently working closely with the two active and permitted mining interests in Elko and Humboldt counties (Barrick and Newmont) on the location of the pipeline alignment through these mining areas. Where access to existing, permitted mineral resources is restricted, Ruby would negotiate compensation for damage, access rights, and easements with mine owners and claim holders.

We received comments that the project route would cross areas where future mining rights have been staked. Ruby identified 200 open mining claims filed on public land for the proposed route as of August 2009. Of these claims, the project centerline would cross 114 claims and would be within 1,500 feet of 86 additional claims. Ruby would negotiate, where appropriate, damages, access rights, and easements with existing, permitted claim owners to compensate for or minimize any restrictions to future mining of mineral resources.

We received comments that sand and gravel resources are limited along various portions of the project and that project requirements for sand and gravel (for aboveground facility sites, access road improvements, *etc.*) may affect the availability of these resources. Ruby estimates that 6,300 cubic yards of gravel would be needed for aboveground facility pads, including compressor stations, meter stations, and MLVs. Ruby has not determined the volumes or locations where gravel fill would be needed for road improvements or maintenance because the volumes and locations would not be known until the roads are used during construction (as traffic and weather conditions would affect the condition of the roads). Ruby estimates that less than 5 percent of the access road mileage would require some gravel for maintenance or improvement (see section 2.2.1). Some access roads would only require placement of gravel at specific locations (*e.g.*, where potholes or ruts currently exist). Ruby has indicated that it would seek gravel locally from existing commercial sand and gravel pits or other retailers. It would not establish its own borrow pits for this project.

TABLE 4.1.2-1

Mineral Resources Within 1,500 Feet of the Construction Workspace for the Ruby Pipeline Project

State/Facility	MP	Mineral Resource	Distance (feet) and Direction From Centerline
WYOMING			
Hams Fork Region	11.8 to 18.4	Coalfield	Intersects Project
Owner Unknown	13.2	Oil/Gas Well	549-North
Owner Unknown	13.8	Oil/Gas Well	168-North
Owner Unknown	16.5	Oil/Gas Well	111-South
Owner Unknown	18.4	Oil/Gas Well	1,100-North
Kampman Mine	18.9	Abandoned Coal Mine	1,300-North
Owner Unknown	18.9	Oil/Gas Well	817-North
Owner Unknown	19.0	Oil/Gas Well	362-South
Owner Unknown	19.3	Oil/Gas Well	237-North
Owner Unknown	19.4	Oil/Gas Well	814-South
Cumberland Gap Hearthstone, Inc.	19.6	Rock Quarry	21-North
Hams Fork Region	21.4 to 23.5	Coalfield	Intersects Project
Kemmerer Adit	24.8	Abandoned Coal Mine	1,035-North
Owner Unknown	27.9	Oil/Gas Well	464-North
Owner Unknown	28.0	Oil/Gas Well	1,290-South
Owner Unknown	29.8	Oil/Gas Well	384-South
Owner Unknown	30.5	Oil/Gas Well	1,217-North
Owner Unknown	33.2	Oil/Gas Well	898-South
Owner Unknown	34.9	Oil/Gas Well	912-North
Hams Fork Region	31.2 to 37.0	Coalfield	Intersects Project
Owner Unknown	41.2	Oil/Gas Well	728-North
Owner Unknown	R42.0	Oil/Gas Well	280-South
UTAH			
Owner Unknown	R54.0	Gravel Pits	108-North
Dairy Ridge Gravel Pit	73.1	Sand and Gravel Pit	357-South
Lead King	94.5	Lead and Silver	1,330-North
McKenzie Flat Pit	94.5	Sand and Gravel Pit	321-North
Fife's Brigham City Pit	106.4	Sand and Gravel Pit	181-South
Wright Pit	106.8	Sand and Gravel Pit	313-North
F.O. Reeder Pit	107.8	Sand and Gravel Pit	1,248-South
Owner Unknown	108.5	Gravel Pit	525-South
Owner Unknown	120.1	Gravel Pit	1,143-South
Nicholas Pit No. 02058	120.2	Sand and Gravel Pit	766-South
Owner Unknown	124.0	Gravel Pit	1,184-South
Christensen Pit	128.6	Sand and Gravel Pit	342-North
Owner Unknown	133.1	Sand and Gravel Pit	292-South
Dove Creek Well Gravel	185.9	Sand and Gravel Pit	326-North
Rosebud Creek Stone	R198.0	Quarry (Estimated Position)	630-South
Owner Unknown	R200.3	Gravel Pit	73-North
Owner Unknown	R202.4	Gravel Pit	222-North
Owner Unknown	R207.6	Gravel Pit	1,354-North
Watercress Road Gravel	205.9	Sand and Gravel Pit	222-South
Transmitter Road Gravel	206.8	Sand and Gravel Pit	507-North
American Montmorillonite	213.8	Volcanic Materials	849-North
South Grouse Creek Mountain	R219.0	Sand and Gravel Pit	Intersects Project

TABLE 4.1.2-1

Mineral Resources Within 1,500 Feet of the Construction Workspace for the Ruby Pipeline Project

State/Facility	MP	Mineral Resource	Distance (feet) and Direction From Centerline
NEVADA			
Owner Unknown	230.8	Lead, Silver, Copper	1,386-North
Owner Unknown	275.9	Prospect	118-North
Hacky Sack	283.7	Barium-Barite	147-South
Owner Unknown	R292.4	Gravel Pit	981-North
The Canyon Property	327.9	Lead, Copper, Zinc	1,381-North
Owner Unknown	R330.1	Gravel Pit	1,255-North
Owner Unknown	R379.2	Gravel Pit	273-North
Owner Unknown	R381.8	Gravel Pit	427-South
Owner Unknown	R383.4	Gravel Pit	247-North
Owner Unknown	R386.1	Quarry	1,170-South
Owner Unknown	R397.9	Gravel Pit	Intersects Project
Owner Unknown	R398.3	Gravel Pit	778-North
Owner Unknown	R399.6	Borrow Pit	Intersects Project
Owner Unknown	R401.7	Gravel Pit	237-South
Silver Hill Mine	423.2	Silver, Lead, Zinc	598-North
Dutch Flat Placer	428.1	Gold, Mercury, Tungsten	1,250-North
Community Pit	438.3	Sand and Gravel Pit	213-South (potential related activity 840-North)
Sand Dunes	444.7	Sand and Gravel Pit	1,097-North
Owner Unknown	451.9	Sand and Gravel Pit	341-South
Amos Mill	452.0	Gold Ore	1,449-South
Owner Unknown	452.2	Sand and Gravel Pit	1,398-South
Owner Unknown	452.7	Sand and Gravel Pit	1,384-South
US Highway Administration	R462.5	Sand and Gravel Pit	1,490-North
US Highway Administration	R463.4	Sand and Gravel Pit	200-North
Owners Unknown	506.7 to518.3	Multiple Prospects	Vary
Owner Unknown	551.8	Sand and Gravel Pits	923-South
Owner Unknown	558.0	Sand and Gravel Pit Group	1,030-West of Vya Construction Camp
OREGON			
Chevron Resources Company	589.4	Geothermal Prospect Well	700-North
Hunt Energy Corporation	597.1	Geothermal Prospect Well	720-South
Hunt Energy Corporation	601.1	Geothermal Prospect Well	360-South
Lakeview	613.4 to 614.6	Direct Use Geothermal Area	Intersects Project
Owner Unknown	630.1	Sand and Gravel Pit	986-South
Owner Unknown	632.9	Possible Former Gravel Pit	364-South
Owner Unknown	R652.4	Possible Former Gravel Pit	127-North
Owner Unknown	R658.0	Possible Former Gravel Pit	Intersects Project
Owner Unknown	R671.6	Gravel Pit	149-North

The BLM noted that the sand and gravel pit at MP 438.3 is designated as a community pit. The community pit designation establishes the right to remove the materials superior to any subsequent claim or entry of the land (43 CFR 3603.11). The Ruby pipeline would cross a portion of the community-designated area that is not currently mined. However, construction activities could affect access to actively mined areas and would prevent future production in the area of the proposed pipeline. The BLM estimates that at least 3.5 acres, containing about 30,000 to 50,000 cubic yards of sand and gravel, would be lost. Furthermore, the BLM notes that a pit has been developed about 840 feet to the north of the pipeline. This pit is authorized for free-use of sand and gravel to the Humboldt County Road Department. The BLM could require Ruby to adopt a minor route realignment to avoid this area or could require Ruby to purchase the gravel to mitigate for the loss.

There is the possibility that the project could cross unknown abandoned mines. Potential hazards associated with abandoned mines could include, but are not limited to, ground subsidence, contaminated water or soils, toxic gas, and the presence of shock-sensitive materials and explosives. Ruby stated that it would complete a preconstruction investigation of the right-of-way to evaluate if abandoned mines are present in the project area. If abandoned mines are present, Ruby would develop site-specific mitigation plans to address identified hazards. Although Ruby has not developed specific plans to date, plans may include measures for avoiding or filling existing or potential voids and sinkholes, cleaning up hazardous materials, *etc.* **We recommend that, prior to construction, Ruby file the results of its preconstruction geological investigation to evaluate if abandoned mines are present in the project area. If abandoned mines are present, Ruby should file a plan to address abandoned mine hazards and file documentation of consultation with the BLM and appropriate state geologists in the development of these plans for the review and written approval by the Director of OEP.**

We also received comments on the draft EIS regarding the potential for hazardous metals, specifically mercury, to be present in naturally occurring rock near the Summit Lake Paiute Tribe Reservation and other areas. Commenters raised concerns over mercury being released to the environment through blasting, fugitive dust, and erosion of geologic materials.

Mercury is a naturally occurring constituent element of the earth. In pure form, it is known as elemental or metallic mercury. Mercury is rarely found in nature in its elemental form; rather it is usually found in nature as inorganic mercury compounds or organic mercury compounds. Inorganic mercury compounds take the form of mercury salts and are generally white powder or crystals, with the exception of mercuric sulfide (cinnabar ore) which is red and turns black after exposure to light. Mercury is commercially mined as mercuric sulfide. The metallic form is refined from mercuric sulfide ore by crushing and heating the ore to vaporize the mercury, then capturing and condensing the vapor into metallic mercury (UNEP, 2002). Soils may also have been contaminated with mercury from human activity (*e.g.*, from certain mining practices).

Natural events (*e.g.*, volcanic activity, weathering of rocks) and human activities (*e.g.*, mining, fuel use) can cause mercury releases into the environment. Human activities, such as manufacturing and energy production (*e.g.*, coal fired electric generation), have increased the amount of mercury that is currently cycling in the atmosphere, soils, and waterbodies (EPA, 2009f). Mercury can also be released to the environment from the improper disposal of mercury-containing products, such as fluorescent bulbs, batteries, switches, and thermometers (EPA, 1997). Once mercury has been liberated from deposits hidden in the earth's crust, it can be highly mobile, cycling between the earth's surface and the atmosphere. When mercury falls in rain or snow, it may flow into bodies of water like lakes and streams. When it falls out of the air as dry deposition, it may eventually be washed into those bodies by rain (EPA, 1997, 2009f; UNEP, 2002).

Organic mercury compounds are formed when inorganic mercury combines with carbon. Methylmercury is the most common organic mercury compound found in the environment. Bacteria in soils and sediments convert inorganic mercury to methylmercury. It is commonly taken up by tiny aquatic plants and animals in this form. As ever-bigger fish eat smaller ones, the methylmercury is concentrated further up the food chain. This process is called "bioaccumulation" (EPA, 1997, 2009f; UNEP, 2002).

Mercury is known to be toxic to humans. Generally, the most subtle indicators of methylmercury toxicity are neurological changes. The neurotoxic effects include subtle decrements in motor skills and sensory ability at comparatively low doses to tremors, inability to walk, convulsions, and death at extremely high exposures. For fetuses, infants, and children, the primary health effect of methylmercury exposure is impaired neurological development (EPA, 1997, 2009f).

Adverse effects of mercury on fish and wildlife include death, reduced reproductive success, impaired growth, and development and behavioral abnormalities. Reproductive effects are the primary concern for mercury poisoning and can occur at dietary concentrations well below those which cause overt toxicity. Sublethal effects of mercury on birds and mammals include liver damage, kidney damage, and neurobehavioral effects. Effects of mercury on plants include death and plant senescence, growth inhibition, decreased chlorophyll content growth, leaf injury, root damage, and inhibited root growth and function (EPA, 1997, 2009f).

Ruby consulted professional geologists who determined that the highest potential along the route for encountering naturally occurring mercury-containing rock is in Oregon between MP 631.5 and MP 633.0. Disturbing mercury-containing rock could expose the rock to weathering and ultimately increase mercury in the environment. The leaching of mercury from these rocks could, overtime, contaminate soil and groundwater, be taken up by plants and animals, and bioaccumulate in the ecosystem. To address potential concerns for mercury exposure, Ruby committed to resurveying this area as well as the area near the Summit Lake Paiute Tribe reservation for any altered rock and for mineralization along faults which may contain mercury. Soil samples from high-probability areas would be collected and analyzed just prior to construction. If elevated metal concentrations are identified from the soil samples, Ruby would develop health and safety protocols (*e.g.*, requirements for capture, handling, storage, and disposal) to mitigate potential impacts. If it is determined that hazardous levels of these metals could become airborne, Ruby would develop additional health and safety protocols and would monitor airborne particulate concentrations in order to maintain a healthy work environment. Ruby also committed to sampling wells and springs in these areas for heavy metals prior to and after construction. To ensure that construction through areas with the potential to have high mercury levels does not spread mercury contamination or cause the release of mercury, **we recommend that, prior to construction from MPs 519.0 to 524.0 and MPs 631.5 to 633.0, Ruby file the results of its preconstruction surveys for mercury-containing rock along these segments, including results of any soil samples collected and analyzed as part of the preconstruction surveys.**

4.1.2.2 Oil and Gas Production

Oil and natural gas are produced in a number of counties crossed by the project. As a result, significant petroleum exploration, recovery, and transportation infrastructure exists in the region, particularly in Wyoming. Table 4.1.2-1 identifies 16 oil and gas wells in Lincoln and Uinta counties within 1,500 feet of the project. Prior to construction, Ruby would call each state's one-call system so that buried utilities, including gathering lines for oil and gas wells, could be identified and flagged before ground-disturbing activities. Where the pipeline would be constructed near a buried gathering line, Ruby would install its pipeline with appropriate clearance. By avoiding existing oil and gas production facilities we believe the project would not interfere with current oil and gas production in the project area.

Additionally, because oil and gas are generally produced from depths of more than 1,000 feet, and because the proposed pipeline generally would be at a maximum depth of 8 feet from the ground surface, construction of the pipeline would not be expected to affect future oil or gas production.

4.1.2.3 Geothermal Extraction and Carbon Sequestration

Areas suited for geothermal extraction are located from the Great Salt Lake Basin in Utah to Klamath County, Oregon. These geothermal resources are used in various places for heating bath houses and swimming pools, for livestock watering and agriculture, and for healing and spiritual purposes. Table 4.1.2-1 identifies three geothermal prospect wells and one "direct use" geothermal area within 1,500 feet of the project in Oregon. The State of Oregon defines a geothermal prospect well as any well drilled as a temperature gradient test well less than 2,000 feet in depth which is used in prospecting for geothermal resources. A direct use area is defined, according to the Oregon Department of Geology and Mineral Industries, by the presence of thermal springs, wells, and geohydrologic settings generally favorable for recovery of thermal water. Geothermal wells and geothermal springs have not been reported in this direct use area; however, Ruby has committed to completing a preconstruction survey in this area to verify that wells and springs are not present. Ruby has not provided a specific plan for constructing near these geothermal resources other than to state that "appropriate measures" would be taken to mitigate impacts on these resources. Regardless, it is unlikely that the relatively shallow excavations for pipeline construction would impact these resources because geothermal resources have their source deep underground. To ensure that geothermal resources would not be affected by the project, **we recommend that, prior to construction from MP 613.4 to 614.6, Ruby file the results of its preconstruction survey of this direct use geothermal area. If Ruby identifies geothermal wells or springs in the geothermal area, Ruby should consult with the Oregon Department of Geology and Mineral Industries to develop appropriate measures to mitigate impacts on these resources and file documentation of consultation and any mitigation plans for review and written approval by the Director of OEP.**

Areas suited for potential carbon sequestration (or carbon capture and storage) were identified in Washoe County, Nevada. Carbon sequestration is an approach to mitigating the contribution of fossil fuel emissions to global warming, based on capturing CO_2 from large point sources, such as fossil fuel power plants, and permanently storing it in deep geological formations underground. Although CO_2 has been injected into geological formations for various purposes, the long-term storage of CO_2 is a relatively untested concept. We are not aware of any immediate plans for carbon injection in the project vicinity; however, we note the potential does exist for future carbon injection in the region.

4.1.3 Geologic Hazards

Potential geologic hazards in the project area include seismicity (earthquakes and faults), landslides, subsidence, flooding/scour, and volcanism. Ruby determined the locations of these potential hazards through various methods including aerial photo review, database searches, literature review, topographic map review, field surveys, and detailed site-specific investigations completed by state-licensed geologists or engineers. Such licensed professionals are responsible to each state for preconstruction surveys and assessments as required under each state's laws. Specific documents were developed for Ruby that assessed specific geologic hazards and were reviewed by state-licensed professionals; these documents were filed with the FERC on September 21, 2009 and are available on the FERC's eLibrary (MACTEC, 2008, 2009a, 2009b). Each of the hazards noted in these reports is discussed in the following sections.

4.1.3.1 Seismicity

Seismic hazards include earthquakes, ground faulting, and secondary effects such as liquefaction and related slope failures. Ruby identified 110 faults or fault zone crossings within 1,500 feet of the proposed pipeline. Seven faults have identifiable recurrence intervals and/or evidence of displacement of earth materials. Information regarding these faults is presented in table 4.1.3-1.

TABLE 4.1.3-1

Faults with Recurrence Intervals/Displacement Crossed by or Within 1,500 Feet of the Ruby Pipeline Project

State/County	Fault Zone	Number of Fault Traces	Recurrence Interval (years)	Vertical Displacement (feet/event)	MP Range	Nearest Aboveground Facility (MP)	Distance to Nearest Compressor Station (miles)
UTAH							
Cache	Bear River Range	2	N/A	N/A	74.4 to 77.5	MLV at 73.4	61.5 (Roberson Creek)
Cache	East Cache	8	15,000 to 30,000	1.5 to 3.0	92.1 to 95.1	MLV at 92.3	68.9 (Wildcat Hills)
Box Elder	Wasatch	4	1,000 to 2,000	3 to 8	104.9 to R109.0	MLV at R108.9	57.9 (Wildcat Hills)
Box Elder	North Promontory	1	3,700 to 5,000	6.5 to 8	144.3	MLV at 144.9	27.5 (Wildcat Hills)
Box Elder	Hansel Valley	1	10,000 to 16,000	7.2 to 8.5	152.7	MLV at 144.9	19.3 (Wildcat Hills)
NEVADA							
Elko	Thousand Springs Valley	1	N/A	8	264.5	MLV/Launcher/ Receiver at 254.9	60.6 (Wieland Flat)
Humboldt	Santa Rosa Range	3	N/A	3 to 6	451.5 to 452.2	MLV at 454.8	23.7 (Desert Valley)

N/A = Not Applicable

During scoping we received several comments regarding the potential for seismic activity to affect the integrity of the pipeline after construction. Forty-seven earthquakes have been recorded between 1872 and 2008 within 100 miles of the proposed project facilities. The earthquake epicenters were primarily located in Nevada and Utah. These events had Richter Magnitude Values that ranged from 5.0 to 7.15 in magnitude (M), with seven of the earthquakes equaling or exceeding 6.0 M. These seven earthquakes are described below. Based on the Richter Magnitude Value scale, an earthquake of 5.0 to 5.9 M is felt by people and would cause major damage to poorly-constructed buildings over a small region or slight damage to well-built structures. A 6.0 to 6.9 M earthquake can be destructive in populated areas up to approximately 100 miles across, and an earthquake of greater than 7.0 M can cause serious damage over larger areas.

Earthquake shaking can also be expressed in terms of the acceleration due to gravity (g). An earthquake with a 2 percent probability of occurrence within any 50-year interval would result in peak ground acceleration between 12 and 80 percent g along the project route, based on the USGS's published seismic hazard mapping for the United States. The entire project would be constructed in an area mapped as having greater than 12 percent g, with approximately 50 percent of the project route in areas with peak acceleration higher than 18 to 20 percent g. The relationship between peak ground acceleration and structural damage is not simple. The USGS states that 10 percent g is a general threshold where structural

damage to dwellings may occur, dependent, in part, on precautions taken in the design and construction of the structure. The damage would also be dependent on the proximity to the earthquake epicenter and the duration and magnitude of the event. The following comparison can be used to equate the Richter Magnitude Value scale and acceleration due to gravity: a seismic event of 5.0 to 5.9 M equates to a peak acceleration of 9.2 to 34 percent g; a 6.0 to 6.9 M earthquake equates to 34 to greater than 124 percent g; and higher M values equate to the upper limit of greater than 124 percent g.

In Wyoming, peak acceleration is mapped between 16 and 30 percent g, and potential damage from a seismic event is considered low to moderate. There have been no reported earthquakes in Wyoming with a magnitude greater than 6.0 M.

In Utah, peak acceleration is between 20 and 80 percent g, with the highest values found in the area of the Wasatch Fault Zone. Utah's strongest earthquake (6.5 M in 1934) occurred approximately 4 miles from MP 156.0 in poorly consolidated rocks along the Hansel Valley fault. The earthquake occurred in a sparsely populated area and resulted in limited property damage. However, vertical displacement along ground cracks of 3 to 10 inches were noted, and collapse structures of 8 to 10 feet in diameter and 36 feet deep were reported within soft material in the surrounding salt flats. An additional earthquake of 6.1 M emanated from the same area in 1975 and caused widespread but light damage to homes in Malad City, Idaho, approximately 22 miles from the project area.

In Nevada, peak acceleration varies from 14 to 30 percent g. Three earthquakes have exceeded 6.0 M in Nevada. The largest earthquake recorded within 100 miles of the project (7.1 M) was in Pleasant Valley in 1915, approximately 40 miles south of MP R400.0. It occurred in a sparsely populated area and caused little reported damage. This earthquake did cause an average 6.5-foot vertical displacement of earth for 37 miles in one area. A 6.9 M earthquake occurred in the Dixie Valley/Fairview Peak area in 1954. The earthquake was centered approximately 96 miles south of MP 422.0. It caused little damage due to the sparse population in the area although vertical and horizontal displacements of 12 feet were reported. A 6.0 M earthquake occurred in Wells in 2008, approximately 16 miles from the project route. It caused heavy damage to 20 buildings and slight damage to 700 buildings.

In Oregon, peak acceleration is between 16 and 30 percent g, and damage from a seismic event is considered low to moderate. Two earthquakes, both of 6.0 M, occurred in the Klamath Falls area in 1993. The epicenter was approximately 40 miles from MP R672.6. More than 1,000 homes and commercial properties experienced approximately $7.5 million in damages.

Based on the seismic hazard mapping of the project route, the project infrastructure would be constructed over active faults, and a significant portion of the project would be in areas mapped with moderate to high peak accelerations. Although the intensity, frequency, and duration of impacts resulting from the potential hazard of earthquakes is difficult to quantify, all of the pipeline facilities would be designed by state-licensed engineers and constructed in accordance with DOT regulations codified in 49 CFR 192 and in accordance with all state and local codes. These specifications ensure that pipeline facilities are designed and constructed in a manner to provide adequate protection from hazards that may cause the pipeline facilities to move or sustain abnormal loads. They also specify placement of MLVs along the pipeline to shut off the flow of gas should an unexpected drop in pressure occur.

The pipeline would be constructed using arc-welding techniques. O'Rourke and Palmer (1994) evaluated the seismic performance of gas transmission pipelines in southern California using arc-welding as a construction method. Based on their findings, electric arc-welded pipelines constructed after World War II, and properly maintained, have never experienced a break or leak as a result of a southern California earthquake. O'Rourke and Palmer also concluded that electric arc-welded pipelines in good

repair are the most resistant type of piping and are generally highly resistant to traveling groundwave effects and moderate amounts of permanent deformation.

Ruby's geotechnical consultant, MACTEC, provided a fault hazard analysis for each of the 31 faults that cross or are within 300 feet of the proposed right-of-way. MACTEC's evaluation included a review of historical seismicity and seismic wave propagation. MACTEC also performed finite element stress analyses at four major fault crossings to evaluate the performance of the pipeline under the abnormal loads that would result from a fault displacement event. Other faults crossed by the pipeline were evaluated by comparing the size of the fault and the orientation to the crossing to those that had been analyzed in detail. MACTEC concluded that the pipeline alignment is reasonably well-positioned at 17 of the fault locations to accommodate anticipated future fault displacements, and that the pipeline steel grade and wall thickness appear to be suitable for expected seismic loading. Eleven of the 14 remaining crossings would require pipeline surveillance, and 3 locations would require design mitigation treatment. Mitigation treatment would include use of heavy wall pipe along a portion of the East Cache Fault Zone where it would cross the East Fork Little Bear River (MP 92.7), adjustment of the pipeline alignment between MPs 108 to 109 to reduce the number of crossings of the Wasatch Fault Zone to one crossing at MP R108.9, and relocation of one MLV in this same area. MACTEC also recommended that the operating plan for the pipeline should include monitoring for all earthquakes greater than 5.5 M that occur within 20 miles of the pipeline alignment to determine their epicenter, followed by field inspection to evaluate any ground cracks in the vicinity of the pipeline. Ruby stated it would implement MACTEC's recommendations and has incorporated the alignment adjustment and the relocated MLV between MPs 108 and R109.

Soil liquefaction can be a secondary effect of seismic activity. Liquefaction is a phenomenon where saturated, non-cohesive soils temporarily lose their strength when subjected to intense seismic shaking. The most susceptible soils are generally sandy or silty and lack cohesion. Susceptible areas are found along rivers, streams, lake shorelines, and in areas with relatively shallow groundwater (less than 30 feet from the ground surface). The BLM has noted that, based on its experience in Nevada, liquefaction is a potential concern between MPs R397 to 415, MPs 426 to 429 and MPs 450 to 484, and asked that this area be evaluated. MACTEC studied the project route for areas susceptible to liquefaction, including the segments of concern identified by the BLM. MACTEC found that only a portion of one of the areas noted by the BLM is susceptible to liquefaction. MACTEC also identified 31 additional areas where soils are susceptible to liquefaction along the pipeline route and completed geotechnical and geophysical studies at all locations. The areas identified by MACTEC are generally between MPs R109 to 126 and near MP 173 in Utah, between MPs 476 to 493 and MPs 553 to 572 in Nevada, and between MPs R616 to 622 and near MP R672 in Oregon. Based on its investigations, MACTEC concluded that liquefaction-induced ground deformation along the pipeline is likely to be expressed as seismic settlement. Though lateral-spread landslide deposits are found in the region, they were not found along the pipeline alignment. MACTEC recommended that in these areas mitigation measures should consist of providing negative buoyancy for the pipe using concrete coating, set-on weights, or screw anchors, and that Ruby should monitor the alignment following the occurrence of significant earthquakes. Ruby has agreed to implement these measures.

Based on the implementation of the fault hazard analysis, stress modeling, the use of mitigation measures, specialized construction methods, and post-seismic event monitoring and inspection, we do not expect seismic hazards or their secondary effects to pose a significant risk to the proposed pipeline facilities.

We also reviewed the Vya Construction Camp and Lakeview Temporary Housing Facility sites for geologic hazards. The only geologic hazard within 1,500 feet of these two sites is a fault near the Vya site. The fault is considered a quaternary active fault, which is defined as a fault that has moved within

the last 1.6 million years. From 1875 to 1968 there have been eight earthquakes with magnitudes ranging from 5.0 to 5.9 M recorded within 100 miles of the camp site. According to the Richter Magnitude Value scale, an earthquake of 5.0 to 5.9 M is felt by people and would cause major damage to poorly constructed buildings over a small region or slight damage to well-built structures. Based on this information, we do not expect seismic hazards to pose a significant risk to the camp or temporary housing facilities.

4.1.3.2 Landslides

A landslide is defined as the movement of a mass of rock, debris, or earth down a slope. Landslides can be initiated by heavy rainfall, earthquakes, changes in groundwater conditions, and/or slope disturbance resulting from construction activity. Generally, Ruby selected flat areas for the siting of compressor stations and other aboveground facilities; therefore, slope failure is not expected at aboveground facility locations. However, slope failures and subsequent landslides represent a potential hazard to the buried pipeline along portions of the project route that would traverse areas of side slopes and rolling terrain. Factors that would increase the potential for slope failure along slopes and rolling terrain include cutting along slopes, the weight of construction equipment, and unusually high precipitation or snowmelt saturating near-surface earth materials.

The majority of the pipeline route would be in areas of low landslide incidence. As defined, a low landslide incidence corresponds to an area where less than 1.5 percent of the terrain has been involved in landslides. A moderate landslide incidence corresponds to a range of 1.5 to 15 percent of the area being involved in landslides, and a high incidence is greater than 15 percent of the area. Approximately 12 percent of the pipeline route (based on length) crosses areas of moderate landslide risk, and approximately 4 percent crosses areas of high landslide incidence. Table 4.1.3-2 summarizes locations of moderate and high landslide susceptibility along the proposed route.

TABLE 4.1.3-2

Areas of Moderate to High Landslide Susceptibility Crossed by the Ruby Pipeline Project

State	MP Range	Landslide Susceptibility
Wyoming	19.9 to 22.6	High
	22.6 to 31.0	Moderate
	31.0 to 37.1	High
	37.1 to 44.2	Moderate
	44.2 to 47.9	High
Utah	85.3 to 91.8	Moderate
	101.5 to 112.4	High
Nevada	513.0 to 515.3	High
	515.3 to 552.4	Moderate
Oregon	607.3 to R615.3	Moderate
	625.6 to 638.0	Moderate

The pipeline would be constructed in accordance with Ruby's Plan and Procedures, which include measures to control runoff and erosion that would minimize the potential for slope failures. Such measures include installation of slope breakers, trench breakers, vegetation, and mulch. Pipeline construction on steep slopes could initiate localized slope movement, and should a landslide occur, sections of the pipe could become exposed and thus would require subsequent reburial. However, we believe that modern construction techniques along with the implementation of Ruby's Plan and Procedures would reduce the potential for construction-related activities to trigger landslides or other slope instability. Furthermore, should a landslide occur, the orientation of the pipeline along the long axis of a slope face would minimize the overall energy to which a segment of pipe would be exposed during a

landslide event. None of the aboveground facilities would be located in an area with recorded landslides or on steep slopes.

4.1.3.3 Subsidence

Subsidence can range from small, localized areas of collapse to broad, regional lowering of the ground surface. It can be associated with areas of karst and pseudokarst terrain, past underground mining, earthquake-induced liquefaction, and withdrawal of fluids such as groundwater and petroleum. It can also be triggered by changing the hydrology of a region, by adding weight over unstable areas, and from man-made vibrations from activities such as blasting and heavy traffic. Ruby has not identified active underground mines within 1,500 feet of the project.

Large area subsidence related to withdrawal of groundwater or petroleum is generally not a concern in the project area, with the possible exception of the Kelly Creek Area Groundwater Basin in Elko and Humboldt counties in Nevada. The BLM has raised a concern that large-scale withdrawal of groundwater for mining and industry in the general area between MPs 399 to 415 has caused subsidence of the land surface with associated fissuring. We spoke with the State of Nevada to discuss subsidence in this area and the State indicated that the subsidence had occurred due to pumping of water by the Newmont Mining Company. The State also noted that pumping and subsidence had ceased in 2006. We then spoke with a Senior Hydrogeologist with Newmont Mining Company to further discuss the incident. The hydrogeologist indicated that the subsidence and fissuring had occurred near the Lone Tree Mine. The Lone Tree Mine is not within 1,500 feet of the project. The maximum subsidence (28 centimeters) had occurred directly at the mine, as had the fissuring. Newmont Mining Company confirmed that pumping at the mine had stopped approximately 3 years ago. The area is currently being studied by the University of Nevada, and no additional settlement has been observed over the last 8 months.

As the subsidence is not expected to continue, the project should not be affected by this hazard. Regardless, all of the pipeline facilities would be designed by state-licensed engineers and constructed in accordance with DOT regulations codified in 49 CFR 192 and in accordance with all state and local codes. These specifications ensure that pipeline facilities are designed and constructed in a manner to provide adequate protection from hazards (*e.g.*, subsidence) that could cause pipeline facilities to move or sustain abnormal loads. DOT regulations also require periodic monitoring of the right-of-way during operation to detect abnormal conditions, such as subsidence or fissuring. We do not expect any unanticipated subsidence and its secondary effects to pose a significant risk to the proposed pipeline facilities at this location.

Karst terrain refers to areas characterized by dissolution of rocks such as limestone, dolomite, gypsum, and salt. Pseudokarst refers to karst-like terrain formed by processes other than solution, or corrosion-induced subsidence and collapse in rocks such as lava. Both refer to areas characterized by sinkholes (closed depressions), pinnacled bedrock, caves/caverns, and underground drainage systems. The tendency for and rate of solubility of rock formations is variable and is believed to be affected by rock mineralogy as well as local structural features, such as jointing, bedding characteristics, and differences in groundwater chemistry.

Approximately 5 percent of the proposed pipeline route has the potential for encountering karst/pseudokarst features. Table 4.1.3-3 identifies areas of the route that would cross potential karst/pseudokarst terrain. Ruby would conduct inspections during the trenching phase of pipeline construction in these karst/pseudokarst areas. If solution features are found, Ruby states that it would develop appropriate mitigation measures based on the specific features identified and their relation to the pipeline trench. Such measures could include, but would not be limited to, the installation of erosion controls to prevent storm water from flowing into the ditch and to areas susceptible to sinkhole

development. Ruby also would avoid discharging hydrostatic test water near potential karst/pseudokarst features.

TABLE 4.1.3-3

Areas of Karst/Pseudokarst Terrain Crossed by the Ruby Pipeline Project

State	MP Range	Type
Utah	96.0 to 112.0	Karst/carbonate rock
Nevada	444.0 to 448.0	Karst/carbonate rock
	521.0 to 525.0	Pseudokarst/lava
Oregon	R655.0 to R663.0	Pseudokarst/lava

Although highly unlikely, an HDD could potentially intercept a solution void in a karst/pseudokarst area or an underground abandoned mine with no surface expression. Depending on the size of the void, this could result in the loss of drilling mud into the void and/or the failure of the drill. Ruby has not indicated what it would do if a solution void were intercepted during an HDD. In accordance with Ruby's Procedures, Ruby would submit to the FERC for review and approval a site-specific plan of the HDD. Because of the potential for adverse impacts from the HDD method, we would expect the plan to include frac-out containment procedures to identify, based on field investigations, potential subsurface features that would be encountered during drilling and what Ruby would do if a void were encountered to limit the amount of mud lost and successfully complete the drill.

UTPL indicated that areas within Utah that have karst features often contain unique and rare habitats, wildlife, and geological features. The office also suggested that these areas are often susceptible to groundwater contamination, resulting in negative impacts on the animals that use these resources. The office requested that Ruby take the necessary precautions to reduce accidental spills in these areas by creating a 100 foot no refueling zone around these areas during construction. If a cave is opened during construction, the State of Utah requested that Ruby inform the UDWR Native Species Specialist. We agree with these measures; therefore, **we recommend that, if Ruby identifies karst/pseudokarst features during construction, it clearly mark the area of the feature and handle and store all fuels, solvents, and lubricants; perform all concrete coating activities; and stage and store all equipment at least 100 feet from the feature. Ruby should inform the appropriate state natural heritage agency if a feature is opened during construction. In addition, Ruby should include the identification of these features in its weekly construction status report.**

4.1.3.4 Volcanism

Volcanic hazards include lahars (debris flows), landslides, lava flows, pyroclastic flows (high-density mixtures of hot, dry rock fragments and hot gases that move away from the vent that erupted them at high speeds), and tephra (typically ash fall). The most likely volcanic hazard within the project area is tephra. Tephra is not likely to affect the pipeline itself but may affect the operation of aboveground facilities and equipment. Mount Shasta is the closest active volcano to the project area, located 60 miles away. Mount Shasta is not likely to erupt large volumes of ash in the future, based on its past behavior. Areas subject to the greatest risk from air-fall tephra are located mainly east and within about 30 miles of the summit of the volcano. Lahars, landslides, lava flows, and pyroclastic flows are not a hazard due to the distance between the pipeline and the nearest volcanoes.

4.1.4 Paleontological Resources

Many geologic formations have the potential to contain paleontological resources; however, those containing vertebrate fossils are generally considered to be the most scientifically significant. The

FLPMA and NEPA mandate the protection of significant paleontological resources on federally owned or managed lands. Potential impacts in fossil localities during construction could include direct impacts such as damage to, or destruction of, fossils resulting from excavation activities; indirect impacts such as erosion of fossil beds resulting from slope regrading and clearing of vegetation; and unauthorized collection of significant fossils by construction personnel or the public.

According to the BLM, a Class 3 paleo-resource area is defined as a moderate or unknown potential and may require a preconstruction survey as determined by the BLM. A Class 4 paleo-resource area has high potential but has a lower potential for human or environmental degradation. A Class 5 paleo-resource is the same as a Class 4 but has a higher potential for degradation. Both Class 4 and 5 areas require preconstruction field surveys.

Ruby completed a literature search and a field survey of right-of-way segments ranked as PFYC 3 and higher so as to classify all geologic deposits along the entire pipeline route (both federal and non-federal land) in accordance with the BLM's PFYC system. Ruby surveyed from the starting point near Opal, Wyoming to MP 335. Ruby's professional consulting paleontologist determined that surveys west of MP 335 were not warranted because geologic maps indicate that similar strata would be encountered and that the percentage of volcanic rock exposures would increase. The survey identified by milepost those areas with the potential to contain significant fossil resources. The following segments (milepost ranges) of the proposed project would cross areas suspected of having a moderate (3) to high (5) potential for containing significant fossils on both public and private land. An estimated 187.8 miles of the project's route would cross areas with a moderate to high potential for fossil resources.

0.0 to 0.6	141.2 to 141.9	250.2 to 250.4	324.7 to 327.7	510.4 to 511.0
1.4 to 6.6	143.2 to 143.5	251.4 to 255.4	328.2 to 328.3	511.6 to 516.2
7.3 to 7.6	187.8 to 188.1	257.2 to 259.8	329.0 to 333.5	517.5 to 517.8
9.2 to 48.1	189.4 to 189.8	262.1 to 262.5	333.8 to 336.7	532.0 to 533.4
55.3 to 60.7	R192.6 to R192.9	263.1 to 264.7	363.5 to 368.0	533.7 to 533.9
61.1 to 71.1	R197.2 to R197.4	265.2 to 266.4	368.7 to 371.5	538.6 to 540.2
71.5 to 72.1	213.5 to 214.0	272.4 to 272.9	374.4 to 374.6	551.7 to 552.0
72.3 to 72.9	228.7 to 228.8	275.9 to 280.2	375.1 to 376.9	554.4 to 555.3
73.6 to 74.0	229.7 to 233.5	283.7 to R292.9	382.1 to 382.5	555.7 to 556.0
74. to 75.1	231.1 to 231.2	R295.2 to 299.3	384.3 to 385.4	570.8 to 571.4
75.4 to 76.6	244.4 to 245.2	300.3 to 301.6	443.8 to 444.7	597.5 to 600.2
76.7 to 82.7	246.7 to 247.0	302.0 to 304.5	456.9 to 460.3	602.2 to 602.4
92.9 to 94.5	247.3 to 257.6	306.8 to 307.4	R464.1 to 483.3	
95.2 to 98.8	248.1 to 248.3	309.2 to 310.3	488.3 to 496.0	
134.8 to R135.5	248.8 to 249.8	311.2 to 315.4	506.1 to 506.2	

Ruby also reviewed the Vya Construction Camp and Lakeview Temporary Housing Facility sites for paleontological resources and concluded the sites do not contain areas of moderate (3) to high (5) potential for containing significant fossils. In response to comments from the BLM regarding upgrading the PFYC in specific areas, Ruby has agreed to conduct preconstruction surveys in areas classified as PFYC 3 for significant fossils between MPs 466 to 485, MPs 490 to 498, at MP 508, between MPs 512 to 518, and between MPs 519 and 520.

The potential for Ruby's construction activities to disturb fossil-bearing rock would be dependent on project location and the depth of the existing soil overburden compared to depth of the proposed excavation(s). Ruby revised its Paleontological Resources Monitoring Plan (Appendix I) in August 2009 and updated the plan in October 2009 to: 1) provide procedures to monitor those areas of the project (both federal and non-federal land) where there are potentially significant fossil resources; and 2) address the

unanticipated discovery of significant fossil resources that may be encountered during construction. Primary elements of the Paleontological Resources Monitoring Plan include:

- mitigation procedures (*e.g.*, avoidance, excavation) for fossil localities identified during construction;
- procedures for in-trench inspections and spot checking; and
- provisions for the preparation and curation of fossil collections.

All work conducted under the Paleontological Resources Monitoring Plan would be performed by a qualified consulting paleontologist and, when on federal land, in consultation with BLM paleontologists in each state. The BLM indicated that it also may utilize third-party paleontological monitors on federal land during construction and that it would require Ruby to report paleontological finds as part of its right-of-way grant. The BLM also requests that Ruby report paleontological finds on non-federal lands to the BLM.

Normal operation of the pipeline and aboveground facilities would not disturb paleontological resources. Although maintenance activities would result in surface disturbance, this disturbance would typically occur in areas previously disturbed by construction. Therefore, operational impacts on paleontological resources would be negligible.

4.1.5 Non-Jurisdictional Electric Power Lines

The Rocky Mountain Power and Harney Electric Cooperative electric transmission and distribution lines would be constructed in the same general geologic setting as the Ruby pipeline. Switching station and meter station impacts would be similar to those described above for pipeline aboveground facilities. Power line impacts would be similar to those for pipelines, except that direct impacts would be limited to borehole locations for the placement of poles. If borings are completed, and for geotechnical reasons cannot be used, the bore holes would be backfilled with tailings or grout to eliminate the hazard associated with an open borehole. It is unlikely that fossil resources would be affected during boring activities. If fossils are observed, a boring could be stopped and the poles moved to a nearby location without significant fossils. According to Ruby, Harney Electric Cooperative would implement Ruby's Unanticipated Discoveries Plan for Paleontological Resources (Appendix I) during construction of its line.

4.2 SOILS

Information regarding the soil types and characteristics occurring in the project area was obtained from the Soil Survey Geographic (SSURGO) database (NRCS, 2004) for 598.3 miles of the overall project length. Information regarding the remaining 76.9 miles was obtained from the State Soil Geographic (STATSGO) database (NRCS, 2006). The STATSGO database describes larger, more generalized soil map units than the SSURGO database. Additionally, not all soil characteristics are described in the STATSGO database. We evaluated the following soil characteristics and limitations: erosion potential (wind and water), designation as prime farmland, compaction potential, percentage of stones/rocks, droughty soil, hydric soil, and potential for shallow bedrock.

Pipeline construction activities such as clearing, grading, trench excavation, backfilling, heavy equipment traffic, and restoration could result in adverse impacts on soil resources along the construction right-of-way, in temporary work areas (including camps and temporary housing facilities), and on new and improved access roads. Clearing would remove protective vegetation cover and would expose soil to

the effects of wind, sun, and precipitation, which could potentially increase soil erosion and the transport of sediment to sensitive areas such as wetlands or waterbodies. Grading and equipment traffic could compact soil, reducing porosity and percolation rates, which could result in increased runoff potential. In addition, grading could result in the mixing of topsoil with subsoil, which could result in long-term reduction of agricultural productivity and could introduce subsurface rocks to the soil surface. Trench excavation and backfilling on the construction right-of-way could also lead to the mixing of topsoil and subsoil; the introduction of excavated rocks from the fracturing of bedrock; and excavation of rock and/or gravel into the soil surface, which could result in a future increase in operation labor, decrease in agricultural productivity, and potential damage to agricultural field equipment. Soil contamination from equipment spills and/or leakage of fuels, lubricants, and coolants could also impact soils. Certain practices, such as the use of Ruby's Plan (Appendix F), Spill Plan (Appendix J), and Restoration and Revegetation Plans (Appendix L), would help minimize impacts on soils.

Impacts associated with construction and operation of the aboveground facilities would be similar to those described above for the pipeline; however, impacts at aboveground facilities would be permanent. Mitigation measures implemented at the aboveground facilities are limited to erosion and sediment control measures due to the fact that land used for construction of the aboveground facilities would be permanently converted to industrial use.

4.2.1 Standard Soil Limitations

Table 4.2.1-1 provides a summary of the soil limitations present along the proposed pipeline. Table 4.2.1-2 provides a summary of the soil limitations present at the proposed aboveground facility sites. Table 4.2.1-3 provides a summary of the soil limitations that would be encountered on new and improved access roads. An area may have more than one soil limitation.

4.2.1.1 Erosion Potential

Erosion is a natural process where surface soils are worn away, typically by wind or water. Factors that influence the erosion potential of soil include gradation (distribution of soil particles), vegetation cover, length and percent of slope, rainfall, and wind intensity. Soils on steep, long slopes are much more susceptible to water erosion than those on short slopes because the steeper slopes accelerate the flow of surface runoff.

Approximately 16.4 percent (110.7 miles) of the soils crossed by the proposed pipeline route are highly susceptible to wind erosion, and 4.0 percent (27.0 miles) are highly susceptible to water erosion (see table 4.2.1-1). Clearing, grading, and equipment movement could accelerate the erosion process. Without adequate protection, this could result in topsoil loss, reduced soil fertility, and erosion of sediment into sensitive areas. The sloping banks of ravines, waterbodies, and soil storage piles would be most susceptible to water erosion. Erosion in highly susceptible areas can be compounded by poor revegetation of the soil. All 160 acres of soil at the Vya Construction Camp and about 10.2 acres of soil at the Lakeview Temporary Housing Facility are highly wind erodible. None of the soils at the Vya camp or the Lakeview facility are highly water erodible.

TABLE 4.2.1-1

Soil Limitations (Pipeline) for the Ruby Pipeline Project (in acres)[a]

State/County	Highly Wind Erodible[b]	Highly Water Erodible[c]	Prime Farmland[d]	Compaction-Prone[e]	Stony-Rocky[f]	Droughty[g]	Shallow Bedrock[h]	Hydric Soils[i]
WYOMING								
Lincoln	12.0 / 167.3	* / *	* / *	0.0 / 0.0	0.0 / 0.0	12.0 / 167.3	6.0 / 83.6	0.0 / 0.0
Uinta	0.0 / 0.0	* / *	* / *	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0	19.4 / 270.4	0.0 / 0.0
UTAH								
Rich	0.0 / 0.0	* / *	4.5 / 62.7	0.3 / 4.2	0.4 / 5.6	0.3 / 4.2	2.8 / 39.0	1.0 / 13.9
Cache	0.0 / 0.0	* / *	0.1 / 1.4	0.0 / 0.0	12.4 / 172.8	0.3 / 4.2	4.5 / 62.7	0.4 / 5.6
Box Elder	10.4 / 145.0	* / *	15.4 / 214.7	11.9 / 165.9	10.2 / 142.2	22.0 / 306.7	5.7 / 79.5	30.3 / 422.4
NEVADA								
Elko	11.6 / 161.7	* / *	10.2 / 142.2	0.0 / 0.0	16.0 / 223.0	10.2 / 142.2	34.4 / 479.5	37.2 / 518.5
Humboldt	56.5 / 958.8	* / *	24.4 / 414.0	0.0 / 0.0	25.4 / 431.1	43.5 / 738.2	28.2 / 478.6	2.5 / 42.4
Washoe	11.2 / 190.0	* / *	0.0 / 0.0	0.0 / 0.0	17.8 / 302.0	9.4 / 159.5	15.5 / 263.1	1.4 / 23.7
OREGON								
Lake	4.6 / 64.1	19.6 / 273.2	2.3 / 32.1	0.0 / 0.0	30.0 / 418.2	3.4 / 47.4	15.4 / 214.7	12.7 / 177.0
Klamath	1.9 / 26.5	7.4 / 103.2	1.2 / 16.7	0.0 / 0.0	22.7 / 316.4	2.5 / 34.8	21.3 / 296.9	0.1 / 1.4
PG&E Lateral	2.5 / 34.8	0.0 / 0.0	2.5 / 34.8	0.0 / 0.0	0.0 / 0.0	0.1 / 1.4	0 / 0	2.4 / 33.5
Total Miles/Acres[a]	110.7 / 1,748.3	27.0 / 376.4	60.6 / 918.6	12.2 / 170.1	134.9 / 2,011.3	103.7 / 1,605.8	153.2 / 2,267.9	88.0 / 1,238.5
Total Percentage[j]	**16.4**	**4.0**	**9.0**	**1.8**	**20.0**	**15.4**	**22.7**	**13.0**

a Acreage calculated assuming a 115-foot wide right-of-way unless otherwise noted. Acreage calculated for BLM lands in Humboldt and Washoe Counties was calculated assuming a 140-foot wide right-of-way.
b Includes soils in wind erodibility groups 1, 2, and 3 (potential erosion rates of 86 to 310 tons per acre per year) (SSURGO reference column "weg").
c Includes soils with water classified as highly erodible land.
d Includes soils designated as prime farmland by the NRCS if drained and/or irrigated and/or reclaimed of excess salts and sodium (SSURGO reference column "farmlndcl").
e Includes soils that meet compaction-prone criteria (*i.e.*, soils with clay loam or finer texture, and somewhat poor, poor, and very poor drainage class) (SSURGO reference column "texcl" and "drainagecl").
f Includes soils that contain greater than 5 percent by weight and stones larger than 3 inches in diameter (SSURGO reference column "frag3to101" and "fraggt10_r").
g Includes soils that meet droughty soils criteria (*i.e.*, soils with sandy loam or coarser texture and are moderately to excessively well drained) (SSURGO reference column "texcl" and "drainagecl").
h Includes soils that have lithic or paralithic bedrock within 60 inches of the soil surface (SSURGO and STATSGO reference column "rescind" and "resdept_r").
i Includes soils that are classified as hydric (SSURGO and STATSGO reference column "hydricrati").
j Percent of total pipeline length including lateral (675.2 miles).
***** Wyoming, Utah, and Nevada contain data gaps in some categories, resulting in a missing or incomplete value.
Note: An area may have more than one soil limitation.

TABLE 4.2.1-2

Soil Limitations (Aboveground Facilities) for the Ruby Pipeline Project (in acres)

Station Name	MP	Permanent Facility Area	Highly Wind Erodible[a]	Highly Water Erodible[b]	Prime Farmland[c]	Compaction Prone[d]	Stony-Rocky[e]	Droughty[f]	Shallow Bedrock[g]	Hydric Soils[h]
King Meter Station (with three Interconnects), MLV 1, Launcher	0.1	13.6	13.6	0.0	0.0	0.0	0.0	13.6	0.0	0.0
Roberson Creek Compressor Station, Meter Station (with one Interconnect), MLV 2, Launcher, Receiver, Communication Tower	5.7	30.8	30.8	0.0	0.0	0.0	0.0	30.8	0.0	0.0
MLV 3	21.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 4	39.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 5	55.1	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
MLV 6	73.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 7	92.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
MLV 8 Launcher/ Receiver	R102.9	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 9	R109.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.1
MLV 10	127.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 11	144.5	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
MLV 12	161.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wildcat Hills Compressor Station, MLV 13 Launcher, Receiver, Communication Tower	172.5	29.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	29.3
MLV 14	R190.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 15	R206.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
MLV 16	222.3	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
MLV 17	239.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
MLV 18 Launcher/ Receiver	257.4	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 19	275.9	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
MLV 20	R292.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 21	311.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Wieland Flat Compressor Station, MLV 22, Launcher, Receiver, Communication Tower	R330.2	25.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 23	345.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
MLV 24	R364.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
MLV 25	R382.8	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
MLV 26 Launcher/ Receiver	R401.8	0.9	0.9	0.0	0.0	0.0	0.0	0.9	0.0	0.0
MLV 27	421.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
MLV 28	437.4	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0
MLV 29	456.9	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Desert Valley Compressor Station, MLV 30, Launcher, Receiver , Communication Tower	476.4	25.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 31	493.2	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0

TABLE 4.2.1-2

Soil Limitations (Aboveground Facilities) for the Ruby Pipeline Project (in acres)

Station Name	MP	Permanent Facility Area	Highly Wind Erodible[a]	Highly Water Erodible[b]	Prime Farmland[c]	Compaction Prone[d]	Stony-Rocky[e]	Droughty[f]	Shallow Bedrock[g]	Hydric Soils[h]
MLV 32	509.8	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
MLV 33 Launcher/ Receiver	528.8	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 34	547.8	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0
MLV 35	567.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MLV 36 Launcher/ Receiver	582.0	0.9	0.0	0.0	0.0	0.0	0.9	0.0	0.0	0.0
MLV 37	601.1	0.1	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0
MLV 38	614.3	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
MLV 39	627.8	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
MLV 40	643.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
MLV 41	R659.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
MLV 42, Receiver Separation Facilities , Tule Lake Valley Meter Station	R672.6	12.2	12.2	0.0	12.2	0.0	0.0	0.0	0.0	0.0
MLV 301-2	--	0.1	--	--	--	--	--	--	--	--
MLV 301-1, Malin Meter Station	--	0.1	0.2	0.0	0.2	0.0	0.0	0.0	0.0	0.1
Total Acres	**--**	138.6	52.5	0.1	7.3	0.0	1.4	45.8	0.1	30.0
Total Percentage[i]	**--**	**--**	**37.9**	**0.7**	**5.3**	**0.0**	**1.0**	**33.0**	**0.7**	**21.6**

a Includes soils in wind erodibility groups 1, 2, and 3 (potential erosion rates of 86 to 310 tons per acre per year) (SSURGO reference column “weg”).
b Includes soils with water classified as highly erodible land.
c Includes soils designated as prime farmland by the NRCS if drained and/or irrigated and/or reclaimed of excess salts and sodium (SSURGO reference column “farmlndcl”).
d Includes soils that meet compaction-prone criteria (*i.e.*, soils with clay loam or finer texture, and somewhat poor, poor, and very poor drainage class) (SSURGO reference column “texcl” and “drainagecl”).
e Includes soils that contain greater than 5 percent by weight and stones larger than 3 inches in diameter (SSURGO reference column “frag3to101” and “fraggt10_r”).
f Includes soils that meet droughty soils criteria (*i.e.*, soils with sandy loam or coarser texture, and are moderately to excessively well drained) (SSURGO reference column “texcl” and “drainagecl”).
g Includes soils which have lithic or paralithic bedrock within 60 inches of the soil surface (SSURGO and STATSGO reference column “rescind” and “resdept_r”).
h Includes soils that are classified as hydric (SSURGO and STATSGO reference column “hydricrati”).
i Percent of total permanent facility area.
***** Wyoming, Utah, and Nevada contain data gaps in some categories, resulting in a missing or incomplete value.
Note: An area may have more than one soil limitation.

TABLE 4.2.1-3

Soil Limitations (Access Roads) for the Ruby Pipeline Project (in acres)[a]

State/County	Highly Wind Erodible[b]	Highly Water Erodible[c]	Prime Farmland[d]	Compaction-Prone[e]	Stony-Rocky[f]	Droughty[g]	Shallow Bedrock[h]	Hydric Soils[i]
WYOMING								
Lincoln	0.1 / 0.4	* / *	* / *	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0	332. / 120.7	0.0 / 0.0
Uinta	0.0 / 0.0	* / *	* / *	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0	0.0 / 0.0	1.1 / 4.0
UTAH								
Rich	0.0 / 0.0	* / *	2.9 / 10.5	0.2 / 0.7	15.6 / 56.7	0.2 / 0.7	6.1 / 22.2	1.7 / 6.2
Cache	0.0 / 0.0	* / *	1.5 / 5.5	0.0 / 0.0	20.7 / 75.3	0.0 / 0.0	7.3 / 26.5	1.0 / 3.6
Box Elder	24.1 / 87.6	* / *	37.5 / 136.4	12.2 / 44.4	40.9 / 148.7	5.1 / 18.5	7.4 / 26.9	44.9 / 163.3
NEVADA								
Elko	18.3 / 66.5	* / *	21.3 / 77.5	0.0 / 0.0	103.8 / 377.5	2.7 / 9.8	74.1 / 269.5	1.4 / 5.1
Humboldt	22.8 / 82.9	* / *	10.9 / 39.6	0.0 / 0.0	28.5 / 103.6	15.9 / 57.8	23.5 / 85.5	0.5 / 1.8
Washoe	7.9 / 28.7	* / *	0.9 / 3.3	0.0 / 0.0	26.4 / 96.0	7.7 / 28.0	25.3 / 92.0	0.1 / 0.4
OREGON								
Lake	1.2 / 4.4	21.6 / 78.5	1.0 / 3.6	0.0 / 0.0	44.8 / 162.9	2.3 / 8.4	7.8 / 28.4	8.9 / 32.4
Klamath	0.0 / 0.0	6.6 / 24.0	0.9 / 3.3	0.0 / 0.0	9.4 / 34.2	0.6 / 2.2	7.2 / 26.2	0.9 / 3.3
Total Miles/Acres[a]	**74.4 / 270.5**	**28.2 / 102.5**	**76.9 / 279.6**	**12.4 / 45.1**	**290.1 / 1054.9**	**34.5 / 125.5**	**191.9 / 697.8**	**60.5 / 220.0**
Total Percentage[j]	**6.8**	**2.6**	**7.0**	**1.1**	**26.3**	**3.1**	**17.4**	**5.5**

a Acreage calculated assuming a 30-foot wide disturbance area.
b Includes soils in wind erodibility groups 1, 2, and 3 (potential erosion rates of 86 to 310 tons per acre per year) (SSURGO reference column "weg").
c Includes soils with water classified as highly erodible land (SSURGO reference column "muwathelcl").
d Includes soils designated as prime farmland by the NRCS if drained and/or irrigated and/or reclaimed of excess salts and sodium (SSURGO reference column "farmlndcl").
e Includes soils that meet compaction-prone criteria (*i.e.*, soils with clay loam or finer texture, and somewhat poor, poor, and very poor drainage class) (SSURGO reference column "texcl" and "drainagecl").
f Includes soils that contain greater than 5 percent by weight and stones larger than 3 inches in diameter (SSURGO reference column "frag3to101" and "fraggt10_r").
g Includes soils that meet droughty soils criteria (*i.e.*, soils with sandy loam or coarser texture and are moderately to excessively well drained) (SSURGO reference column "texcl" and "drainagecl").
h Includes soils that have lithic or paralithic bedrock within 60 inches of the soil surface (SSURGO and STATSGO reference column "rescind" and "resdept_r").
i Includes soils that are classified as hydric (SSURGO and STATSGO reference column "hydricrati").
j Percent of total access road length (1101.3 miles).
***** Wyoming, Oregon, and Utah still contain data gaps in some categories, resulting in a missing or incomplete value.
Note: An area may have more than one soil limitation.

Certain measures in Ruby's Plan are designed to control erosion and sedimentation during construction. For example, Ruby would install and maintain various erosion control devices including temporary slope breakers on slopes and temporary sediment barriers such as straw bales or silt fence at the base of slopes adjacent to waterbodies, wetlands, and roadways, and along the edge of the right-of-way. Installation of such measures would help prevent sediment from flowing across or off the right-of-way during construction.

Ruby also would implement the waterbody crossing methods outlined in its Procedures (Appendix F) to minimize potential impacts from water erosion and sedimentation near waterbodies. Ruby would install and maintain sediment barriers across the entire construction right-of-way at all waterbody crossings to prevent flow of sediment into the waterbody and to contain spoil and sediment within the construction right-of-way. In addition, trench plugs would be used as necessary to prevent diversion of water into upland portions of the pipeline trench and to keep any accumulated trench water out of the waterbody. All waterbody banks would be returned to a stable condition after construction.

Where trench dewatering is required, Ruby would pump water from the trench to a well-vegetated upland area away from the wetland or waterbody banks or into a sediment filtration/energy dissipation device in a manner that would not cause erosion and would not result in heavily silt-laden water flowing into any waterbody.

Post-construction, Ruby would implement revegetation measures as outlined in its Plan, Procedures, and Restoration and Revegetation Plans to reduce the potential for long-term erosion due to lack of vegetation cover. Ruby would also comply with National Pollution Discharge and Elimination System (NPDES) storm water requirements and any local conditions regarding site stabilization.

Permanent impacts on highly wind erodible soils at aboveground facilities would total 52.5 acres, or about 37.9 percent of the total area for all aboveground facilities. Permanent impacts on highly water erodible soils at the aboveground facilities would be 0.1 acre, or 0.7 percent of the total area for all aboveground facilities. While these soils would be permanently affected, they are likely to have fewer erosion issues post-construction due to permanent erosion control measures that Ruby would install at the aboveground facility locations. The BLM has noted that Ruby's proposed contractor yard located 9.5 miles south of MP 439.0 in Humboldt County, Nevada is located in a highly unstable, windswept dune area that is used recreationally and that any improvements would be subject to burial by continuously migrating sands, especially during moderate to high wind events. In areas where this does occur, the contractor would be responsible for maintaining the yard through the duration of the project after which the yard would be decommissioned and the area restored.

The USFS identified a concern about construction impacts on soils in the Fremont National Forest, including shallow soils. Construction activities such as clearing, grading, trench excavation, backfilling, heavy equipment traffic, and restoration along the construction corridor could have the potential to adversely affect natural soil characteristics and reduce soil productivity. It would not be possible to avoid soils that are highly susceptible to erosion as outlined in the Fremont LRMP (USFS, 1989), as the pipeline route traverses east-west across the Fremont National Forest. A longer route also would impact other resources and would cause a shift in effects to riparian areas and other resources of value. Soil disturbance along the proposed route would exceed 20 percent detrimental soil conditions from displacement and compaction. This impact would be unavoidable due to the pipeline construction process. Soil impacts associated with compaction are expected to be small because soils in the Fremont National Forest are not overly compaction-prone (based on soil texture information from the NRCS). The USFS concluded that successful mitigation for erosion and compaction would be possible and such

mitigation would offset the environmental impact of a longer pipeline route and the associated resource impacts.

We received several comments expressing concern about soil erosion and mud slides in areas of steep terrain. Areas of steep slopes (such as those found in South Canyon and Scarce Canyon, Utah) would require the use of specific measures to prevent soil erosion and mud slides during and after construction. Ruby would avoid stockpiling grading and trench materials in areas of steep slopes and would shuttle spoil to extra workspaces and staging areas further back along the pipeline route. Slope breakers would be used to divert runoff from disturbed areas on slopes to more stable areas. Erosion control measures would include trench breakers at proper spacing, sediment barriers, slope breakers, wattles, erosion control blankets, and mulching as detailed in Ruby's Plan. Trench breakers would prevent the flow of water along the pipeline, divert excess water off the right-of-way, and would help anchor the trench. The extent of utilization of mulch on federally managed land is being established during the development of Ruby's POD. Section 2.3.2.5 describes construction through areas of steep terrain.

We also received several comments expressing concerns about erosion control in areas prone to washouts, including washouts in the water basin in the Oak Valley, Oregon area. As with other areas, Ruby would stabilize soils in these areas in accordance with its Plan and Procedures. We believe the techniques proposed by Ruby adequately address erosion control. The BLM, USFS, state, or other jurisdictional agency might require additional measures as stipulations to any authorizations they issue.

4.2.1.2 Prime Farmland

According to the USDA, prime farmland soils consist of soils classified as those best suited for production of food, feed, forage, fiber, and oilseed crops. These soils generate the highest yields with the least amount of expenditure. Soils currently occupying pastures and fields or otherwise undeveloped forest and open land can be classified as prime farmland soils; lands occupied by surface water or residential, commercial, or industrial uses cannot receive this designation. Prime farmland soils generally meet the following criteria: have an adequate water supply, either from precipitation or irrigation; contain few or no rocks; are permeable to water and air; are not excessively erodible or saturated for long time periods; and either do not flood frequently or are protected from flooding.

Approximately 9.0 percent (60.6 miles) of the proposed pipeline route crosses soils designated as prime farmland (this includes soils classified as prime farmland if drained and/or irrigated and/or reclaimed of excess salts and sodium). Approximately 49.2 acres of the soils at the Vya Construction Camp and 0.2 acre of soil at the Lakeview Temporary Housing Facility are classified as prime farmland, if irrigated.

Potential impacts on agricultural uses and prime farmland soils from pipeline construction include soil erosion, interference with and damage to agricultural surface and sub-surface drainage systems and irrigation systems, the mixing of topsoil and subsoil, the potential loss of fertile topsoil, and topsoil compaction. Additional analysis of agricultural-related issues is presented in section 4.8.1.3 of this EIS.

Construction of aboveground facilities would affect about 7.3 acres of prime farmland soils (see table 4.2.1-2). The 12.2-acre footprint at the Tule Lake Valley Meter Station accounts for most of this prime farmland soils acreage. The Tule Lake Valley Meter Station is near the end of the Ruby pipeline in actively cultivated agricultural land and is surrounded by actively cultivated prime farmland for several thousand feet in all directions. There are no nearby non-prime farmland areas that would offer alternative sites for the MLV. While these soil resources would be permanently lost, the acreage affected is a small

fraction of the available prime farmland soils and would not significantly reduce the overall agricultural production in the area.

4.2.1.3 Compaction Potential

Soil compaction occurs when soil particles are compressed. Soil compaction modifies soil structure and can result in a reduction in the porosity and moisture-holding capability of the soil, thus restricting rooting depth. Compaction also decreases infiltration and thus increases runoff and the potential for water erosion. The risk for compaction is greatest when soils are wet. Therefore, fine-grained soils having poor drainage characteristics have the greatest propensity for compaction. Construction equipment traveling over wet or saturated soils could disrupt soil structure, reduce pore space, increase runoff potential, and cause rutting and topsoil-subsoil mixing. Approximately 1.8 percent (12.2 miles) of the soils crossed by the proposed pipeline route are highly susceptible to compaction. None of the soils at the Vya Construction Camp site and all 15.2 acres of soil at the Lakeview Temporary Housing Facility are compaction prone.

Ruby would test for and alleviate compaction in all agricultural and residential areas in accordance with its Plan. Testing would be conducted using a penetrometer or other appropriate device and would be performed on the same soil type under similar moisture conditions in undisturbed areas. Decompaction efforts would be commensurate with the level of preconstruction compaction identified during testing. Compaction impacts would be mitigated through use of a paraplow or other deep tillage implement. As an alternative, Ruby could make arrangements with the landowner to plant and plow under a "green manure" crop, such as alfalfa, to decrease soil bulk density and improve soil structure. There are no compaction-prone soils at aboveground facilities.

4.2.1.4 Stony-Rocky or Droughty Soils

Stony soils are identified as soils having more than 5 percent by weight of particles larger than 3 inches. The presence of stony-rocky soils could interfere with agricultural practices and inhibit revegetation efforts. Droughty soils have a surface texture of sandy loam or coarser material and are moderately well drained to excessively drained. As a result, droughty soils may not be able to sustain adequate moisture levels in the root zone, and revegetation is often difficult.

About 20.0 percent (134.9 miles) of the soils crossed by the proposed pipeline route are defined as stony-rocky. About 15.4 percent (103.7 miles) of the soils crossed are classified as droughty. None of the soils at the Vya Construction Camp or the Lakeview Temporary Housing Facility are stony-rocky or droughty. Construction through stony-rocky soil could bring rock to the surface, which could interfere with agricultural practices and hinder revegetation of the right-of-way.

Ruby would use padding material such as sand or fine grain soil or gravel in the bottom of the trench in rocky areas to protect the pipeline. Where the excavated material is rocky, the pipeline would be covered with more suitable fill. About 1 cubic yard of suitable fill (also referred to as padding) would be needed per linear foot of pipeline. Ruby would obtain padding by screening excavated trench material to separate fine soil from rocky soil, crushing rock to an acceptable size, exchanging spoil from one location on the right-of-way to another, and/or importing new material from a commercial source (the most costly option). Toposoil would not be used for pipe padding. Ruby has not yet identified the specific volume of pipe padding that would be needed for the project. Such information is typically not known until after trenching is completed. Based on previous experience, Ruby estimates that less than 3 percent of the route would require imported padding from a commercial source (*e.g.,* existing sand or gravel pit). Ruby also may elect to minimize the need for pipe padding by installing rock shield around the pipeline. Rock shield is a flexible pipeline wrap designed to protect the pipeline where rocky backfill

is unavailable. Once the pipe is sufficiently covered with suitable material or wrapped in rock shield, the excavated rocky soil would be used for backfill within the original rocky soil horizon.

Ruby would remove and dispose of excess blast/excavated rock (which is considered construction debris) according to its Plan. Ruby also would remove excess stones and rock greater than 4 inches in diameter from at least the top 12 inches of soil in all actively cultivated or rotated cropland and pastures, hayfields, and residential areas, as well as at the landowner's request, provided the surrounding area has minimal rock in the top 12 inches. Ruby has committed to ensuring that the size, density, and distribution of rock on the construction work area at the completion of construction would be similar to adjacent areas not disturbed by construction. In droughty soils, mulch application would be used to conserve soil moisture, which would also provide stability of the soil surface and reduce erosion. We conclude that Ruby's use of its Plan would minimize impacts from construction through these types of soils.

Permanent impacts on stony-rocky soils at aboveground facilities would total 1.4 acres, or about 1.0 percent of the total area for all aboveground facilities. Impacts on droughty soils would total 45.8 acres, or about 33.0 percent of the total area for all aboveground facilities.

4.2.1.5 Hydric Soils

Hydric soils are defined as soils that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper horizon. This definition includes soils developed under sufficiently wet conditions to support the growth and regeneration of hydrophytic vegetation, and soils that are sufficiently wet because of artificial measures. Locations where hydric soils are encountered may also contain artificial drainage systems.

Approximately 13.0 percent (88.0 miles) of the soils crossed by the proposed pipeline route are designated as hydric soils. None of the soils at the Vya Construction Camp and all 15.2 acres of soil at the Lakeview Temporary Housing Facility are considered hydric. Construction through hydric soils and wetlands is discussed in section 4.3.3 of this EIS. Implementation of the measures contained in Ruby's Plan and Procedures would also minimize impacts on hydric soils.

Permanent impacts on hydric soils at aboveground facilities would total 30.0 acres, or about 21.6 percent of the total area for all aboveground facilities. Examples of permanent impacts on hydric soils could include (but are not limited to) decreased water storage capacity of the soil, decreased porosity, or decreased ability to sustain hydrophytic vegetation. It should be noted that no wetlands exist at potential aboveground facility sites.

4.2.1.6 Shallow Bedrock

Soils indicated as having shallow bedrock have the potential for bedrock to occur within 60 inches of the soil surface. Approximately 22.7 percent (153.2 miles) of the proposed pipeline route has the potential for shallow bedrock. None of the soils within the Vya Construction Camp or Lakeview Temporary Housing Facility are classified as having shallow bedrock. Permanent impacts on soils with shallow bedrock at aboveground facilities would total 0.1 acre, or about 0.7 percent of the total area for all aboveground facilities.

Specialized mechanical equipment or blasting may be required in order to trench through areas of shallow bedrock. Ruby's Plan would allow blast rock to be used to backfill the trench up to the level of the preexisting bedrock profile and would require the removal of excess blast/excavated rock (which is considered construction debris). Blasting is discussed in more detail in sections 2.3.2.7 and 4.1.1.2.

4.2.2 Other Soil Limitations

In addition to the standard soil limitations discussed in section 4.2.1, we received comments about the project's impacts on several other soil features that are found in the proposed project area.

4.2.2.1 Surface Horizon Alkalinity

The project would cross moderately acidic soils (potential hydrogen [pH] 5.6 to 6.0), slightly acidic soils (pH 6.1 to 6.5), neutral soils (pH 6.6 to 7.3), slightly alkaline soils (pH 7.4 to 7.8), moderately alkaline soils (pH 7.9 to 8.4), strongly alkaline soils (pH 8.5 to 9.0), and very strongly alkaline soils (pH 9.1 to 9.6) (NRCS, 1998). Soils with higher pH values have fewer nutrients and can present challenges to revegetation efforts. Soils with pH ranges from 6.0 to 7.2 are ideal for most plants. Soils with pH ranges from 7.0 to 8.0 are adequate for plants adapted to arid environments like the western United States. Soils above a pH of 8.0 may need to be mixed with a pH-reducing agent, and soils with pH below 6.0 may require the addition of alkaline materials in order to sustain vegetation (Cox and Koenig, 2003). Ruby's Plan specifies that it would add soil pH modifiers in accordance with the written recommendations of the local soil conservation authority, land managing agency, or landowner. Ruby has not received any written recommendations to date.

4.2.2.2 Cryptobiotic Crusts

Cryptobiotic crusts or biological soil crusts are thin veneers of microbial-rich plant material that live on the surface of many soils in desert areas (USGS, 2001). Other names for these communities include cryptogamic or microbiotic soil crusts. They are commonly found in semiarid and arid environments. Cryptobiotic soil crusts are formed by living organisms predominantly composed of cyanobacteria, green and brown algae, lichens, and mosses that become interwoven communities that bind the soil together and increase surface roughness. Cryptobiotic soil crusts have the effect of protecting the soil from erosion and act as a living mulch that retains moisture. Erosion reduction and water retention are essential for plant growth in the arid environment of the proposed project area. Additionally, the increased surface relief has been shown to provide safe sites for seeds to germinate, particularly native seeds that have self-drilling mechanisms.

While crust thickness can reach up to 4 inches, crusts are typically concentrated in the top 0.5-inch of soil. Some crusts can be identified by the dark color of dense cyanobacteria, lichens, or mosses. Other crusts, without lichens or mosses, can appear similar to soil but still may contain cyanobacteria and other components that are microscopic and therefore not visible during visual identification. Cyanobacteria are the low-successional stage of soil crust formation, whereas the lichens and mosses are present in more developed and complex soil crusts. Cyanobacteria are the most resistant component of soil crusts to disturbance, and are highly mobile when moist and can recolonize disturbed surfaces rapidly (Belnap, *et al*., 2001). The more complex organisms exhibit less resistance to disturbance.

Cryptobiotic soil crust communities are poorly adapted to any sort of disturbance. The large pieces of construction equipment necessary to clear the construction right-of-way of vegetation and dig the trenches for the pipeline would break the biological community of interwoven sheaths and filaments, drastically reducing the ability of the soil organisms to function, particularly in reducing erosion or providing necessary nutrients to plants.

Impacted biological soil crust communities recover at different rates based on many factors including disturbance severity, species composition, site conditions, and the availability of crust communities from adjacent sites. Some soil resource specialists have estimated that cryptobiotic crusts

can take 5 to 250 years for full recovery after alteration, if at all. Development of early successional stage crusts can form in as little as 1 to 5 years and be composed mostly of cyanobacteria and green algae (USGS, 2006). Rainfall and other environmental conditions can influence the rate at which soil crusts are able to redevelop. Loss of biological crusts can reduce infiltration by precipitation, leave the soil susceptible to erosion by wind and water, and alter the vegetation cover and habitat of the disturbed area for many years. Loss of cryptobiotic crusts due to pipeline construction would be considered an irreversible or irretrievable impact.

Ruby has attempted to identify areas of cryptobiotic soils along the project via literature review and agency contact; however, limited data were available. Areas of cryptobiotic soil crusts were identified during field surveys in the areas of MPs 170.0, 487.9, and 594.0, which are likely the more complex and older crusts. Another area near MP 625.5 (approximately 1,300 feet from the project) was noted to have a cryptobiotic soil crust. Cryptobiotic soil crusts were not identified at the Vya Construction Camp or the Lakeview Temporary Housing Facility. Aboveground facilities are not proposed in areas with known or visually identifiable high concentrations of cryptobiotic crusts.

To reduce impact on cryptobiotic crusts, Ruby proposes to limit the construction right-of-way width in the identified areas of cryptobiotic crusts to 75 feet and would not locate extra workspaces within these areas. Ruby would take steps to restore the crusts to the disturbed areas in the event that damaging or destroying the crusts could not be avoided. The top 2 to 5 inches of topsoil, inclusive of the cryptobiotic soils, would be carefully stripped and stockpiled separately from all other soil materials in areas of identified cryptobiotic soils and at the request of the land managing agency.

The USGS has recommended on similar projects a more intensive, three-step soil segregation and restoration process, which we believe would increase the probability of successful restoration of the cryptobiotic crusts. Specifically, the USGS technique would involve segregating soils into three piles consisting of (1) the top 2 inches of topsoil in a long, broad, and shallow windrow; (2) the remaining topsoil; and (3) the subsoil. Organic matter and debris would be retained in the piles to help sustain biological activity and increase the effectiveness of respreading the crust material after construction. Additionally, in order to give biological soil crust communities the best possible chance of reestablishing themselves along the disturbed right-of-way, we believe that the USGS crust restoration techniques should be employed. The USGS's crust restoration techniques include reapplication of the top 2 inches of topsoil after all other activities in the area are completed, including seeding, followed by immediate watering in areas of cryptobiotic crusts following replacement of the top 2 inches of topsoil. Therefore, **we recommend that Ruby implement the USGS's specified soil segregation technique for cryptobiotic soil crusts in the areas of MPs 170.0, 487.9, and 594.0.** Ruby stated that it would monitor the success of cryptobiotic crust restoration for 5 years following construction. At the end of the 5-year period, Ruby would file a report identifying the status of the crust restoration and the need for any additional restoration efforts.

4.2.2.3 Playas

Playas are horizontal surfaces that occupy the bottoms of topographic depressions. They function as shallow ephemeral ponds with highly variable hydro-periods that are directly or indirectly related to the amount and distribution of seasonal precipitation. Ephemeral ponds produced by winter and spring precipitation can persist from late winter until early summer, whereas ephemeral ponds produced by summer storms might persist no longer than 1 to 2 weeks. Playas are generally found in the lowest portions of arid basins that have internal drainage and periodically flood.

How playas form and evolve has been a subject of geologic research and debate. Generally, playas form in natural topographic depressions from either the accumulation of surface water (surface water discharge playas), or as a result of groundwater discharge (groundwater discharge playa).

To maintain a surface water discharge playa habitat requires the presence of an underlying, generally shallow, low to impermeable layer of caliche, hardpan, or rock that inhibits percolation of the ponded water. The ponded water is derived from overland water flow from precipitation events within the watershed or as direct precipitation. Water is lost from these ponds through evaporation or slow percolation. Disruption or breaching the underlying impermeable layer would allow ponded water to percolate more rapidly than it would have without the disruption and the habitat setting would be damaged or lost. Soils beneath the impermeable layer are generally unsaturated as the groundwater beneath this type of playa would be tens to hundreds of feet below the playa surface elevation, deeper than the height of potential capillary rise (Kendall, 1980).

Groundwater discharge playas are created when a topographic depression intersects the groundwater table creating seeps or springs, and/or when capillary movement of groundwater or phreatophytes (*i.e.*, deep-rooted plants that obtain water from a permanent ground supply or from the water table) bring water to the ground surface. Overland flow and direct precipitation contribute to the surface water in the playa; however, these playas do not have an underlying impermeable layer. When precipitation to the watershed ceases and the groundwater level drops to a point either below the depression's base or to a level where capillary flow will not reach the land surface, the surficial water body will eventually evaporate leaving a characteristic evaporite crust (salts or gypsum) on the playa surface (Eugster, 1978). Groundwater discharge is thought to be dominant in the formation of playas in the Great Basin of the United States, notably in Nevada and western Utah, where pluvial lakes occupied large topographically closed (internally drained) basins thousands of years ago.

Ruby has identified six playas along the proposed route (at MPs 150.5, 167.0, 168.6, 171.0, 487.9, and 565.3). No playas were identified within the Vya Construction Camp site. All identified playa areas appear to have formed in pluvial settings. Geotechnical and geophysical data were collected at 17 locations within these potential playa habitats and evaluated by Ruby's consultants. Ruby determined that shallow impermeable layers were not present at any location evaluated; that generally lake bottom sediments were prevalent; and shallow groundwater conditions predominated. In summary, conditions to support surface water discharge playas were not present and these playas were likely derived from groundwater discharge.

Numerous stakeholders have expressed concern that digging a trench through the impermeable layer of soil in a playa could alter the surface hydrology in the area. The initial data collected by Ruby indicate that impermeable layers are not present in these playa habitats. To assure their initial assessment of the playas is accurate, Ruby has committed to completing additional geological studies along the trenchline during pipeline construction, but prior to excavating the trench, within the referenced playa areas to verify that soil conditions do not include caliche or other impermeable layers. In the event that impermeable soils are found at a depth shallower than 8 feet, Ruby would segregate and store the impermeable soil layer from the overlying soils. Ruby would restore the impermeable soil layers with the corresponding original excavated trench material during backfilling operations.

To further mitigate impacts and ensure playa habitat is maintained, Ruby would limit the construction right-of-way width to 75 feet in playas. Ruby stated that it would attempt to construct the pipeline across playas during drier periods of the year (generally July through October) although Ruby did not definitively commit to a schedule. Ruby indicated that if ponded water is encountered during the construction period, it would install trench breakers at the boundaries of these features to limit the horizontal movement of water along the trenchline and prevent drainage. Most pipe installed in playas

with saturated soils would be coated with concrete or equipped with set-on weights to provide negative buoyancy.

Although Ruby has stated that it would not locate temporary extra workspaces within playas, except where a playa contains an impermeable soil layer, we believe that Ruby should not locate extra workspaces, staging areas, or water appropriation sites within playas under any circumstance. Ruby has proposed to use temporary extra workspaces and a pipe storage yard at MP 487.9 that would overlap a playa (see maps in Appendix B). Therefore, **we recommend that Ruby relocate the temporary extra workspaces and a pipe storage yard at MP 487.9 to avoid the underlying playa and file the revised workspace and yard locations for review and written approval of the Director of OEP. Where temporary work areas abut a playa, Ruby should install exclusion fencing and warning signs around the playa to prevent project disturbance.** Ruby would include these measures in its final construction alignment sheets filed for review and written approval by the Director of OEP prior to construction activities.

Ruby has committed to monitoring the success of restoration at all playa locations for 5 years following construction and has specifically committed to documenting playa hydrologic conditions when water is most likely to be present. At the end of the 5-year period, Ruby has stated that it would file a report identifying the status of the playa restoration and the need for and status of any additional restoration efforts. Based on this information and our recommendation we believe impacts on playas would be minimized.

4.2.3 Spill/Contamination Prevention

Soil contamination along the pipeline route could result from spills during construction and could be encountered by trench excavation through existing contaminated areas. Ruby completed a preliminary evaluation of state and federal databases for sites along the right-of-way that potentially contain contaminated soils, contaminated groundwater, hazardous wastes, or other hazardous materials. Based on this preliminary evaluation, no contaminated soils or groundwater or hazardous wastes or material sites are present within 0.25 mile of the project. Ruby stated that it would seek additional information on potential contamination hazards by questioning landowners during land negotiations. If contaminated locations are identified, Ruby would complete a detailed evaluation of the hazard and develop mitigation measures to properly address each specific situation. Mitigative measures could include, but would not be limited to, modification of the construction zone to avoid contamination and proper removal of wastes prior to construction.

Contamination from spills or leaks of fuels, lubricants, coolants, and solvents from construction equipment could impact soils. Ruby's Spill Plan (Appendix J) includes clean-up procedures designed to minimize soil contamination that could result from accidental spills or leaks of fluids from construction-related equipment or materials. Ruby would implement the procedures set forth in the Spill Plan to minimize the spread of contamination and to ensure the health and safety of construction workers and the general public in the event that an unanticipated area of suspected contamination is encountered during construction. Ruby's Spill Plan includes, but is not limited to, measures for:

- identifying preventative measures to avoid hazardous material spills or leaks;
- regulating locations for refueling, lubricating, and equipment washing activities;
- providing for vehicle and equipment inspection and maintenance;
- defining proper storage and handling of fuels, lubricants, and hazardous materials;
- identifying immediate spill response procedures; and
- establishing reporting and notification protocols.

4.2.4 Topsoil Segregation

Construction activities such as grading, trenching, and backfilling could cause mixing of soil horizons. Mixing of topsoil with subsoil, particularly in agricultural lands, could leave less-productive soil in the root zone, which could lower soil fertility and decrease the ability of disturbed areas to revegetate successfully. Operating heavy equipment under wet soil conditions could cause deep soil compaction and topsoil/subsoil mixing in agricultural areas, especially where the ditch-plus-spoil-side topsoil segregation method is used. Ruby's Plan includes directives for topsoil segregation to prevent or minimize the mixing of topsoil with subsoil. Ruby's Plan identifies the locations where topsoil segregation is appropriate and the methods for segregating topsoil. In accordance with its Plan, Ruby would segregate topsoil from subsoil over the trenchline and subsoil storage area across the entire length of the project with the following exceptions and modifications:

- Ruby would utilize the full right-of-way topsoil method (1) where requested by the landowner or land managing agency; (2) to prevent the mixing of topsoil and subsoil and to prevent the temporary cessation of construction activities in areas where rutting exceeds 6 inches and topsoil and subsoil are expected to mix; (3) in areas of steep slopes, side hills, or cut and fill.

- No topsoil segregation would occur in saturated wetlands.

- No topsoiling would occur in areas where significant surface rock and/or bedrock are present at the surface such that it is not practical or possible to topsoil. Following backfilling activities, if sufficient topsoil cannot be separated from the surface rock/topsoil windrow created during grading, additional topsoil (or possibly clean, organic material, such as wood chips) would be hauled from a local source and evenly distributed across the right-of-way at a depth similar to topsoil conditions adjacent to the right-of-way. Any topsoil or organic material obtained from offsite would need to be certified as weed-free by the EI.

- In locations where topsoil is thin (*i.e.,* 2 inches or less) no topsoil segregation would occur, except in areas where cryptobiotic soils are located. Following backfilling activities, topsoil would be hauled from a local source and evenly distributed across the disturbed portion of the right-of-way at a depth similar to topsoil conditions adjacent to the right-of-way. As an alternative, Ruby may elect to utilize hydro-mulching.

- Ruby would not utilize the ditch-plus-spoil-side method in areas where alternative methods have been agreed upon by appropriate agencies to protect sensitive species as outlined in the Cooperative Conservation Agreement, MBTA Memorandum of Understanding, or the ESA Conservation Action Plan, or in accordance with other agency stipulations or requirements for the project.

- In irrigated and cultivated fields Ruby would, at a minimum, segregate the ditch line and spoil-side topsoil or, as noted above, would segregate the entire construction right-of-way topsoil at the landowner's request.

- If rutting occurs but topsoil and subsoil do not mix, Ruby would rip the compacted topsoil up to 12 inches in depth to decompact the topsoil after the completion of construction activities and prior to the reseeding of the right-of-way.

- Prior to the replacement of segregated topsoil, Ruby would rip or disc the compacted subsoil to a depth not to exceed 12 inches. Topsoil would then be replaced, final cleanup would be completed, and disturbed areas would be seeded per Ruby's Restoration and Revegetation Plans (Appendix L).

- Where topsoil is lost due to construction activities, Ruby would be responsible for replacing topsoil with topsoil from a local source.

Where topsoil exists and segregation is required, no more than 12 inches of topsoil would be segregated. Most soils along the project have between 6 and 12 inches of topsoil. The native seed base is contained in the top 12 inches of topsoil, and removal of deeper topsoil would dilute this seed base and slow the return of native vegetation. Separation of salvaged topsoil and subsoil would be maintained throughout all construction activities. Ruby would protect the topsoil piles from loss or mixing with subsoil, being utilized as trench backfill or pipe padding, and from wind and water erosion as indicated its Plan. In any areas where replacement of topsoil is required as a result of rutting, Ruby would replace such topsoil with topsoil from a local source acceptable to the landowner or land managing agency.

Ruby is proposing to expand the construction right-of-way width by up to 25 feet in limited, non-wetland areas to accommodate full right-of-way topsoil segregation or to ensure safe construction where required by topographic conditions (such as steep side-slopes) or soil limitations. According to Ruby, the extra width could also be used for temporary storage of timber, slash, stumps, surface rock, or snow; or in non-wetland, non-forested areas for truck turn-arounds where no reasonable alternative access exists. The BLM stated that it would not authorize the extra width in all requested areas on federal lands. Ruby's proposal, as written, would allow expanding the construction right-of-way width in wetlands, playas, and forested areas without the need for additional regulatory approval. We do not concur with this proposal, therefore, **we recommend that Ruby revise its Plan to prohibit expanding the construction right-of-way width for temporary storage of timber, slash, stumps, surface rock, or snow in wetlands, playas, and forested areas. Ruby should file its revised Plan prior to construction.**

4.2.5 Non-Jurisdictional Electric Power Lines

According to soil survey obtained from the NRCS, the Rocky Mountain Power electric transmission and distribution lines would be constructed in the Youjay-Westvaco-Monte-Kandaly-Haterton soil series, which consists of deep, well-drained soils of fine sand formed from weathered sedimentary rock. The Harney Electric Cooperative distribution lines would be constructed in Boton complex, Cresal silt loam consociation, and Pumper-Weso soil associations. Power line impacts on soils would be similar to those for pipelines, except that direct impacts would be limited to switching station and meter station sites, pole locations, and other areas on the right-of-way where and the ground would be graded to provide safe and efficient operation of construction equipment. Soils in these areas would be exposed to water and wind erosion and compaction and rutting. Impacts would be minimized by the implementation of erosion control best management practices. At the completion of project work, reclamation and re-vegetation of drilling locations, access roads and equipment staging areas would reduce the effects of continued potential erosion. Soil impacts due to the proposed work would be temporary and minor.

4.3 WATER RESOURCES

4.3.1 Groundwater

Aquifers within the project area include large-scale systems formed in bedrock and unconsolidated sedimentary deposits (referred to as "basin-fill aquifers") and waterbearing zones of relatively small extent in glacial deposits and alluvial deposits along streams and rivers. The project would cross portions of three major aquifer systems: the Upper Colorado River Basin aquifer system (primarily sandstone aquifers) in Wyoming; the Basin and Range aquifer system (primarily carbonate rock and basin-fill aquifers) in Utah and Nevada; and the Pacific Northwest aquifer system (primarily basaltic rock and basin-fill aquifers) in Oregon. The project would cross numerous north-south-trending mountain ranges that consist of consolidated carbonate rocks or relatively impermeable metamorphic, igneous, and clastic rocks. These mountain ranges provide recharge water for the basin-fill and carbonate aquifers that lie within the mountain valleys.

The Upper Colorado River Basin aquifer system underlies portions of eastern Utah, western Colorado, northeastern Arizona, northwestern New Mexico, and over 20,000 square miles of southwestern Wyoming. In Wyoming, the Upper Colorado River Basin aquifer system consists of five aquifers. The Wasatch-Fort Union aquifer is the most widely exposed at the land surface in Lincoln and Uinta counties where the project would be located. Portions of the Laney aquifer and the Dakota through the Nugget aquifers may also be present in these counties. The principal water-yielding bodies in all three aquifers are sandstones, though other sedimentary rock is present. Most of the fresh water in the aquifer system is in the Wasatch-Fort Union aquifer. Groundwater is generally less than 200 feet below the land surface in the majority of the aquifer, with shallower groundwater found near major springs and surface water bodies that serve as discharge areas. Water in the western part of the aquifer moves from recharge areas in the mountains towards the Green River and its tributaries and towards the Flaming Gorge Reservoir. Water yields in most wells range from 1 to 50 gallons per minute (gpm). Wells completed in the Upper Colorado River Basin aquifer system commonly are 300 to 900 feet deep and locally are 1,000 to 3,000 feet deep. These aquifers are deeply buried or overlain by fine-grained rocks in many places. The aquifers generally contain freshwater only where they are exposed at the land surface; water is generally saline or briny in the deeply buried parts of the aquifers.

The Basin and Range aquifer system extends over approximately 200,000 square miles of the southwestern United States and underlies most of Nevada and parts of eastern California, southern Oregon and Idaho, western Utah, southern Arizona, and southwestern New Mexico. This aquifer system includes basin-fill aquifers and aquifers where the groundwater moves primarily within carbonate rock. The Basin and Range basin-fill aquifers consist of moderately consolidated, well- to poorly-sorted beds of gravel, sand, silt, and clay deposited on alluvial fans, pediments, flood plains, and playas. Water generally moves under unconfined conditions from recharge areas along the margins of mountainous basins toward discharge areas at the center of structural basins near the centers of valleys. Aquifer discharge occurs through upward leakage to shallower aquifers and then the major streams. The thickness of the basin-fill aquifers is not well-known in some basins but ranges from about 1,000 to 5,000 feet in many basins and may exceed 10,000 feet in a few deep basins in Utah and south-central Arizona. These aquifers generally have high hydraulic conductivities and, in places, allow rapid infiltration from the surface. Because of their high conductivity, rapid recharge, and good yield these aquifers can be a significant water supply source; however, they are also susceptible to contamination. The Basin and Range carbonate rock aquifers generally underlie the basin-fill aquifers. These aquifers consist primarily of limestone, dolomite, and marble with some quartzite, shale, siltstone, and sandstone in formations that are thousands of feet thick. Groundwater yield varies within the aquifers depending on the degree of secondary dissolution (primarily karst formation) within the bedrock. Groundwater generally flows through soluble rock to fractures and solution openings that can vary in size from small tubes to caverns.

Groundwater also may flow through the bedrock from basin to basin, or beneath basins from mountainous recharge areas to discharge areas. Well yields and spring flows can be very high in areas where fractures and solution openings comprise well-connected networks and the rock is thickly saturated.

The Basin and Range aquifer system is a principal source of groundwater in Arizona, Nevada, and Utah. Historically, over three-quarters of the groundwater from this aquifer system has been used for irrigation purposes. Metropolitan areas and outlying communities are increasingly dependent on this aquifer system to meet potable water supply demands.

The Pacific Northwest aquifer system is comprised of basaltic rock and unconsolidated basin-fill aquifers in the project area. Groundwater movement in basaltic rock aquifers is limited by the fine-grained nature of basalt. Groundwater is generally present within structural features that have formed in the rock such as cooling joints, secondary fractures, and faults, and in rubble zones and semi-consolidated sand and gravel deposits eroded from these formations. Groundwater also can be found in ash and cinder deposits. Groundwater flow through basalt is primarily through the secondary fracture features; flow to wells can be limited. However, aquifers can be productive in areas where the rock extends over large areas, is sufficiently thick, and contains interconnected fractures. In such areas reliable water supplies have been developed that can at times yield several thousand gpm. Generally, wells developed in basaltic rock aquifers yield less than 100 gpm. Most of the withdrawals from these aquifers are used for agricultural purposes, primarily irrigation.

The Pacific Northwest basin-fill aquifers are prevalent along present and ancestral stream valleys and in lowlands that are associated with structural or erosional basins. They are primarily made up of alluvial-deposited sand and gravel with varying amounts of finer-grained sediments. Groundwater in the basin-fill aquifers is generally present under unconfined conditions. These aquifers generally have high hydraulic conductivities and are therefore susceptible to contamination. The basin-fill aquifers are the most productive and widespread aquifers in Oregon and are utilized as public, domestic, industrial, and commercial water supplies. Well yields in these aquifers are highly variable; yield generally increases with the coarseness and uniformity of the sediments that comprise the aquifer. Fresh water well yields are reported to range generally from 20 to 2,000 gpm. Salinity does increase near coastal areas and in the central portion of Oregon where groundwater is found in closed basins.

4.3.1.1 Sole-Source and Protected Aquifers

None of the aquifers that would be crossed by the project have been identified as EPA-designated sole- or principal-source aquifers.[1] The project would cross a Class I pristine aquifer[2] in Cache County, Utah from MPs 92.0 to 92.8 and MPs 94.6 to 95.0. Construction and operation of a project in a Class I aquifer requires operators to comply with state groundwater quality standards as described in Utah Administrative Code R317-6 (*e.g.*, sampling and monitoring discharges for physical characteristics, inorganic chemicals, metals, organic chemicals, *etc.*). By following these standards, construction and operation of the proposed project would not result in a discharge that would jeopardize groundwater quality within this aquifer; therefore, the project should not impact this aquifer.

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[1] The EPA defines a sole- or principal-source aquifer as one that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. The EPA guidelines also stipulate that these areas have no alternative drinking water source(s) that could physically, legally, and economically supply all those who depend upon the aquifer for drinking water.

[2] A Class I Pristine Aquifer is defined as an aquifer exhibiting both a total dissolved solid concentration of less than 500 mg/l and no contaminant concentration that exceeds groundwater quality standards as defined in Utah Administrative Code R317-6-2.1.

4.3.1.2 General Impacts and Mitigation

The project would cross several areas known to contain groundwater within 6 feet of the ground surface. These areas are located in Box Elder County, Utah (MPs 109.0 to 119.7 and 124.0 to 127.0); Humboldt County, Nevada (MPs 404.0 to 410.0, 454.0 to 464.0, 466.0 to 483.0, and 488.0 to 497.0); and Lake County, Oregon (MPs 614.3 to 627.6). Construction activities including clearing, trench excavation, dewatering, fuel handling, and blasting could affect groundwater in several ways. Clearing and grading would remove vegetation that provides filtration and slows surface runoff. Trenching and soil stockpiling activities would temporarily alter overland flow and groundwater recharge and could alter near-surface groundwater flows where shallow groundwater is encountered. Heavy equipment used for construction could compact the soil along the right-of-way and slow groundwater recharge rates, and the trench could fill up with water during construction. We also note that known locations of deeper groundwater may contain localized areas of shallow groundwater that could be intersected by the trench. For example, the Desert Valley Groundwater Basin has a seasonal groundwater depth of about 10 to 15 feet. A seasonal depth means that the groundwater depth may fluctuate from the surface (historical flooding on the playa) to about 15 feet below the surface. A trench constructed to 6 feet below the ground surface could potentially intercept surface water or impact the aquifer at any depth below the surface, depending on the season. If the trench were to intercept or be very close to intercepting groundwater, a potential exists for impacts on the aquifer.

Construction of the pipeline would require trenching and backfilling to a depth of at least 6 feet below the ground surface. Trenching and backfilling generally would occur 50 to 100 feet above most of the water-bearing zones that would be encountered along the project. For this reason, construction effects to shallow aquifers are not likely.

Total suspended solid levels in some surficial aquifers could increase if shallow groundwater were encountered during construction activities. Trench dewatering may also result in localized, minor changes in the water table. Effects from construction of the pipeline would likely be temporary, and the shallow groundwater system would recover to equilibrium within a period of days to a few months. Dewatering of the trench would occur in a well-vegetated adjacent upland area or through a sediment filter and energy displacement device, which would likely recharge the impacted aquifer. Groundwater impacts during construction also would be minimized or avoided by implementing construction practices outlined in Ruby's Plan and Procedures (Appendix F), such as installing trench plugs to prevent the movement of water along the buried pipeline; restricting or modifying construction practices during heavy rains and potential rutting circumstances; and limiting herbicide application to comply with state or federal requirements.

The backfilled trench could have different soil permeability after construction as compared to the surrounding undisturbed soils. The disturbed soil could potentially act as a conduit to transport groundwater and increase infiltration of surface water. This could cause subsurface erosion and ground subsidence along the pipeline. Ruby would install trench breakers where necessary to minimize the potential of subsurface water flow along the trench. Additionally, Ruby would work with landowners to ensure that subsidence along the trench is corrected.

Shallow groundwater could affect the buoyancy of the pipe (*i.e.*, the pipeline would be more likely to rise to the ground surface) and could increase the potential for pipe corrosion. Saturated soil conditions could also increase the difficulty of trench excavation and reduce the stability of the trench wall during pipeline placement and subsequent inspection of the pipeline before backfilling. Ruby would install weights, use concrete-coated pipe, or anchor the pipeline in areas where the positive buoyancy of the pipeline may exceed the combined uplift resistance of backfilled soil and soil adjacent to the ditch. Ruby would use externally coated pipe and install cathodic protection where necessary to guard against

corrosion. Ruby's implementation of these measures would reduce impacts associated with shallow groundwater to less than significant levels.

One landowner present at the draft EIS public comment meeting in Brigham City, Utah, noted that he had completed drainage work to feed a pond at MP 107.5 and was concerned that construction would impact his project. Ruby is currently working with the landowner on the precise alignment of the pipeline on his property. Ruby has committed to testing the flow and quality of the water on the property prior to and after construction.

Ruby stated that it would restore overland flow and recharge patterns to preconstruction conditions by recontouring the surface of the ground as close as practicable to preconstruction contours, alleviating soil compaction, and replanting vegetation using seed mixes that are compatible with the dominant vegetation communities in the area. Impacts from construction are expected to be localized and temporary. Impacts from operation are expected to be minimal, as hydrostatic testing and use of groundwater along the pipeline across the entire system are not routine operations. In the unlikely event of a pipeline rupture, groundwater impacts would be minimal due to the marginal solubility of natural gas and its rapid dispersal once exposed to air.

4.3.1.3 Water Supply Wells and Springs

Ruby researched state databases to identify water supply wells and springs in the project area. In addition, Ruby field-verified the location of 21 wells and 60 springs within 200 feet of the proposed pipeline route (see tables 4.3.1-1 and 4.3.1-2).

Potential construction-related impacts on public and private wells and springs could include localized decreases in groundwater recharge rates, changes to overland water flow, contamination, decreased well yields, decreased water quality (such as increased turbidity or odor in the water), interference with well mechanics, or complete disruption of the well or spring. These impacts could result from trenching, equipment traffic, hazardous materials spills, or blasting.

Wells along or near the proposed right-of-way would not be susceptible to observable decreases in groundwater recharge. Many of these wells are completed in bedrock aquifers or other groundwater-bearing zones at depths of over 100 feet below the ground surface. Other wells in alluvial settings are recharged within the setting of river and stream deposits. Recharge to these aquifers occurs over a much wider source area than would be affected by pipeline clearing and trenching. Trench backfill and compaction mitigation, along with implementation of site restoration; storm water pollution prevention activities; and spill prevention, control, and cleanup activities would avoid or minimize potential impacts on groundwater recharge and water quality.

Ruby has stated that it would maintain the safe operation of each water well and its associated underground piping (water supply) or provide an alternative water source to ensure that water supply to agricultural crops or livestock is not affected by construction activities. Ruby also would provide a temporary source of water should damage occur to a water supply during construction, and would work to quickly repair any damaged system. Alternatively, Ruby would adhere to mutually agreed-upon damage remedies that would be specified in an individual easement agreement with the landowner.

Ruby identified two stock watering wells and two irrigation wells that are less than 50 feet from the proposed pipeline centerline. Ruby stated it would realign the pipeline centerline at least 50 feet away from potable wells within the permitted construction right-of-way. Each well would be marked with temporary construction fencing to distinguish its location. In addition, Ruby has committed to documenting the condition of potable water wells within 200 feet of the construction right-of-way prior to

the start of construction and after construction is completed. As detailed in its Groundwater Monitoring Plan (Appendix G), Ruby would have each well within 200 feet of the construction right-of-way tested prior to construction by a certified water testing laboratory for depth; contaminants associated with fuels, lubricants, oils, *etc*.; and standard drinking water parameters. These same wells would be tested again for the above parameters within 1 year of completed construction. If significant differences are found at a well, Ruby would test again within 1 year, prior to making any corrections or repairs. Ruby would provide a temporary source of water or provide other remedies as agreed to by the landowner in the event that a well is damaged by construction activities. We feel that 1 year is too long before testing and repairing wells. Therefore, **we recommend that Ruby conduct its proposed post-construction well testing within 30 days of the completion of construction in the area of each water well presented in table 4.3.1-1 of this EIS. If testing indicates diminished yield, water quality, and/or usability, Ruby should provide a temporary source of water or provide other remedies as agreed to by the landowner.**

TABLE 4.3.1-1

Water Supply Wells Within 200 Feet of the Ruby Pipeline Project

State/County	Approximate MP	Well Use	Distance (feet)/Direction From Construction Workspace
WYOMING			
Uinta	33.2	Miscellaneous	85.8-South
UTAH			
Rich	57.4	Irrigation	184.5-North
Cache	R76.2	Domestic, Stockwatering	295.0-North
Cache	76.6	Domestic, Stockwatering	52.6-North
Box Elder	107.6	Domestic, Irrigation, Stockwatering	122.7-South
Box Elder	109.1	Irrigation, Stockwatering	83.0-South
Box Elder	130.6	Stockwatering	166.9-North
Box Elder	185.0	Stockwatering	203.0-South
NEVADA			
Elko	241.2	Irrigation	15.1-South
Elko	R293.1	Irrigation	39.1-North
Humboldt	R404.4	Irrigation	81.6-North
Humboldt	410.8	Mining and Milling	167.8-South
Humboldt	410.8	Irrigation	167.8-South
Humboldt	410.8	Mining and Milling	167.8-South
Humboldt	410.8	Mining and Milling	167.8-South
Humboldt	410.8	Mining and Milling	167.8-South
Humboldt	410.8	Mining and Milling	167.8-South
Humboldt	410.8	Mining and Milling	167.8-South
Humboldt	415.9	Irrigation	131.2-South
Humboldt	497.4	Unknown	162.9-South
Humboldt	503.3	Irrigation - Carey Act	175.0-North

Note: Duplicate mileposts and distance identify wells with multiple water rights.

Ruby has identified 33 springs that are less than 50 feet from the proposed pipeline centerline. These springs are utilized as a water source for domestic use, irrigation, stock watering, and by wildlife.

Ruby has indicated that it would attempt to avoid these features during construction, and that the spring heads would be restored to reestablish normal flow where impacts are unavoidable. Ruby stated in its October 2009 Groundwater Monitoring Plan that, prior to construction and with landowner permission, it would test each spring with a state-permitted water use within 200 feet of pipeline construction, and each spring where a landowner has expressed concern over impacts on the spring, for baseline condition, yield, and water quality. Ruby, however, has not provided specific details on follow-up testing or how it would address damage to springs from construction. To ensure adequate testing and restoration of springs, **we recommend that, prior to construction, Ruby test all springs presented in table 4.3.1-2 of this EIS. Testing should be conducted using a certified water testing laboratory and should include analysis of yield; contaminants associated with fuels, lubricants, oils, *etc*.; and standard drinking water parameters. These same springs should be tested again within 30 days of the completion of construction in the area of the spring. If testing indicates diminished yield, water quality, and/or usability of the spring for its permitted or intended purposes, Ruby should provide a temporary source of water or provide other remedies as agreed to by the landowner.**

A transient public water system well[3] is located about 2,000 feet from the proposed pipeline route near MP 444.0. Project activities would occur outside the 1,000-foot Drinking Water Protection Area defined for this transient public water system; therefore, no impacts are anticipated.

Ruby has determined that the project crosses or is near seven wellhead protection areas in Utah and Oregon. Wellhead protection areas are generally established by states to manage land use in areas where groundwater is used to supply public drinking water. The project right-of-way crosses wellhead protection areas in Utah between MPs 100 and 107 and in Oregon between MPs 610 and 611. Ruby's alignment maps also show that the pipeline route abuts a wellhead protection area in Utah near MP 130 and that the Lakeview Temporary Housing Facility would be in a wellhead protection area in Oregon approximately 4 miles northwest of MP 611. Points of groundwater acquisition for hydrostatic testing and dust control, as described in section 4.3.1.6, have been identified, and Ruby has also mapped points of potential project water discharge. Points of water appropriation do not fall within the wellhead protection areas; however, the potential discharge points do. Therefore, **we recommend that, prior to construction, Ruby should file plans developed in consultation with the appropriate state agencies to protect wellhead protection areas.**

We received a comment regarding concern that construction trenching could impact water discharge at One Mile Spring in Nevada, which is located approximately 4,350 feet south of the right-of-way at MP 521.5. Ruby's geotechnical consultant MACTEC delineated the drainage basin that potentially conducts surface water flow to One Mile Spring and evaluated the potential effect of interception and diversion of water flow by construction of the pipeline on this spring. MACTEC determined that the pipeline alignment does not cross the One Mile Spring drainage basin and, therefore, would not intercept surface water that might feed the spring directly. MACTEC, however, did identify lineaments in the project area and concluded that these lineaments could influence groundwater discharge at One Mile Spring. MACTEC noted that groundwater likely would be below the depth of the trench in this area, with the exception of two locations: one at an unnamed stream at MP 521.7 and the other at a lineament at MP 522.3.

[3] Per Nevada Revised Statutes 445A.848, a transient water system means a non-community water system that does not regularly serve at least 25 of the same persons for more than 6 months per year.

TABLE 4.3.1-2

Springs Within 200 Feet of the Ruby Pipeline Project

State/County	Approximate MP	Water Use	Distance (feet) and Direction From Construction Workspace
UTAH			
Cache	80.3	Domestic, Stockwatering	63.3-South
Cache	80.3	Domestic, Stockwatering	63.3-South
Cache	80.3	Stockwatering	63.3-South
Cache	80.7	Stockwatering	190.7-South
Cache	85.4	Stockwatering	18.2-North
Cache	85.4	Stockwatering	18.2-North
Cache	87.2	Domestic, Stockwatering	46.6-North
Cache	92.3	Unknown	19.2-North
Box Elder	102.6	Stockwatering	190.0-North
Box Elder	R104.9	Stockwatering	128.3-North
Box Elder	R104.9	Irrigation, Other	128.3-North
Box Elder	R104.9	Stockwatering	56.6-North
Box Elder	R104.9	Irrigation, Other	56.6-North
Box Elder	R104.9	Stockwatering	7.2-North
Box Elder	R104.9	Stockwatering	42.4-North
Box Elder	R104.9	Irrigation, Other	42.4-North
Box Elder	R104.9	Irrigation, Other	195.9-South
Box Elder	R104.9	Irrigation	195.9-South
Box Elder	R104.9	Irrigation, Stockwatering	195.9-South
Box Elder	R105.1	Stockwatering	15.1-North
Box Elder	R105.1	Irrigation, Other	15.1-North
Box Elder	R105.1	Stockwatering	99.9-South
Box Elder	R105.8	Other	182.4-South
Box Elder	106.7	Unknown	78.8-North
Box Elder	107.8	Domestic, Irrigation, Stockwatering	101.8-North
Box Elder	107.8	Domestic, Irrigation, Stockwatering	101.8-North
Box Elder	109.1	Irrigation, Stockwatering	83.0-South
Box Elder	225.9	Stockwatering	105.2-North
NEVADA			
Elko	300.1	Unknown	30.3-South
Elko	311.0	Irrigation	179.8-South
Elko	324.8	Stockwatering	54.5-South
Elko	329.2	Unknown	26.4-North
Elko	346.8	Stockwatering	0.9-South
Humboldt	415.9	Quasi-municipal	131.2-South
Humboldt	415.9	Stockwatering	131.2-South
Humboldt	415.9	Stockwatering	131.2-South
Humboldt	415.9	Stockwatering	131.2-South
Washoe	574.3	Stockwatering	15.8-North
OREGON			

TABLE 4.3.1-2

Springs Within 200 Feet of the Ruby Pipeline Project

State/County	Approximate MP	Water Use	Distance (feet) and Direction From Construction Workspace
Lake	589.8	Unknown	49.9-South
Lake	600.4	Unknown	77.6-South
Lake	600.7	Unknown	144.8-South
Lake	603.1	Unknown	32.2-South
Lake	610.7	Unknown	22.9-North
Lake	611.5	Unknown	62.4-North
Lake	R614.9	Unknown	18.8-South
Lake	R614.9	Unknown	22.6-South
Lake	R614.9	Unknown	32.3-North
Lake	R615.0	Unknown	9.8-North
Lake	R615.0	Unknown	23.7-South
Lake	R615.0	Unknown	49.4-South
Lake	R615.0	Unknown	2.5-South
Lake	R615.0	Unknown	43.4-South
Lake	R615.0	Unknown	46.9-North
Lake	R615.0	Unknown	17.4-North
Lake	R615.0	Unknown	25.0-South
Lake	R615.1	Unknown	137.0-South
Lake	R629.2	Unknown	76.8-South
Lake	R638.8	Unknown	0.9-North
Lake	R638.8	Unknown	9.9-North
Klamath	R647.0	Unknown	36.2-South
Klamath	R651.9	Unknown	37.9-North

Note: Duplicate mileposts and distance s identify springs with multiple water rights.

MACTEC recommended that a geologic inspection occur during trench excavation and that trench plugs be installed in the vicinity of these two locations to control the amount and velocity of water that might move through the trench backfill. Trench plugs would allow water to infiltrate through the native materials to the groundwater and would maintain natural groundwater gradients, elevation, and flow direction. Ruby stated it would implement MACTEC's recommendations and would not appropriate any groundwater from the watershed area of One Mile Spring for hydrostatic testing or dust control. Ruby additionally has committed to monitoring both water quality and quantity at One Mile Spring prior to, during, and after construction. Based on MACTEC's One Mile Spring analysis and Ruby's implementation of MACTEC's recommendations as well as our recommendations above, we conclude that there would not likely be impacts on One Mile Spring.

4.3.1.4 Accidental Spills of Hazardous Materials

Pipeline construction necessitates the use of heavy equipment and associated fuels, lubricants, and other potentially hazardous substances that, if spilled, could affect shallow groundwater and/or unconsolidated aquifers. Accidental spills or leaks of hazardous materials associated with vehicle fueling, vehicle maintenance, and material storage would present the greatest potential contamination threat to groundwater resources. Soil contamination resulting from these spills or leaks could continue to add pollutants to the groundwater long after a spill had occurred.

Implementation of proper storage, containment, and handling procedures would minimize the chance of such releases. Ruby's Spill Plan addresses preventative and mitigative measures that would be used to avoid or minimize the potential impacts of hazardous material spills during construction. Measures outlined in the Spill Plan and in Ruby's Plan and Procedures include, but are not limited to:

- spill prevention and response training for construction personnel;
- regular inspection of construction equipment for leaks;
- prohibition of fueling and lubricating activities and hazardous material storage in or adjacent to sensitive areas;
- secondary containment for storage of fuels, oils, hazardous materials, and equipment;
- collection and disposal procedures for wastes generated during equipment maintenance;
- emergency response procedures; and
- standard procedures for excavation and off-site disposal of any soils contaminated by spillage.

We have reviewed Ruby's Procedures and Spill Plan and find that these protocols adequately address the storage and transfer of fuels and hazardous materials and the response to be taken in the event of a spill, except that neither Ruby's Procedures nor Spill Plan establishes a spill prevention setback from water supply wells or springs. Therefore, we recommend that **Ruby revise section IV.A.1 of its Procedures, and its Spill Plan, to prohibit handling or storage of fuels, solvents, or lubricants; performing concrete coating activities; or staging or storing equipment within 200 feet of any water supply well or spring.**

A release of natural gas from the pipeline would be a release of a gas to the atmosphere and would therefore not constitute a "spill" of contaminants or hazardous materials.

4.3.1.5 Blasting Impacts on Groundwater

Blasting may be required at various locations of shallow bedrock from MP 57.5 to the end of the project, depending on the presence of shallow bedrock. Blasting could affect groundwater quality by

temporarily changing groundwater levels and increasing groundwater turbidity near the construction right-of-way.

Ruby would attempt to utilize specialized excavation methods to reach the required pipeline design burial depth in areas where shallow bedrock is encountered. These excavation methods could include ripping or the use of hydraulic hammers or rock saws. However, blasting may be necessary to achieve the required trench depth if excavation methods prove to be ineffective or inefficient. Ruby developed a Blasting Plan (see Appendix N) to minimize potential adverse impacts on the environment, nearby water sources, structures, or utilities. As stated in the Blasting Plan, all applicable federal, state, and local regulations would be observed and all necessary permits would be obtained. All blasting activities would be conducted by licensed blasting contractors in accordance with all applicable regulatory requirements.

Tables 4.3.1-1 and 4.3.1-2 identify a number of wells and springs within 200 feet of potential blasting areas. Ruby's Blasting Plan has set PPV to a level that should protect water wells, springs, and other nearby structures from any structural damage. For instance, the industry standard for many years has been 12 inches per second maximum PPV on any underground structures. Generally, Ruby expects PPVs to be 6 inches per second or lower on any underground structures and 1.5 inches per second or lower on wells and aboveground structures. We anticipate that any effect to nearby wells and springs from blasting would be temporary and would likely dissipate shortly after blasting or after the well had been flushed several times. As stated in section 4.3.1.3, Ruby has agreed to test wells and we are recommending that Ruby test springs within 30 days after construction in that area.

One comment was received regarding concern that blasting could impact groundwater discharge at One Mile Spring in Nevada (MP 521.5) located approximately 4,350 feet south of the right-of-way. Ruby's geotechnical consultant MACTEC evaluated the effect of blasting specifically on this spring. MACTEC determined that the underlying rock is volcanic in nature and that lava tubes (pseudokarst) theoretically could be present. Based on rock type and anticipated charge, the theoretical "worst case" blasting evaluated by MACTEC could cause structural damage ranging from 5 to 20 feet from the blast, and vibrations from the blast would be perceptible to humans inside of 3,200 feet. However, based on COE studies cited by MACTEC in their report, a minimum PPV of 36 inches per second is required to cause collapse of a cavern roof formed in rock. At a distance of 5 feet or less from the anticipated blast on the project, MACTEC reports that the PPV is expected to be 18 inches per second. Based on this analysis and the distance of the point of blasting from One Mile Spring, potential impacts on the spring from direct vibrations is considered negligible. Collapse of underlying caverns that could be conduits for groundwater flow to the spring is considered unlikely.

4.3.1.6 Groundwater Appropriation

Ruby would use both groundwater and surface water sources for hydrostatic testing and dust control. That is, Ruby would verify the integrity of its pipeline before placing it into service by conducting a series of hydrostatic tests. Ruby also would implement dust control procedures when a visible plume of dust extends more than 300 feet from the source with an estimated opacity exceeding 20 percent. Ruby has identified 65 groundwater wells that it proposes to use for dust control and hydrostatic testing. The surface water sources Ruby proposes to use for hydrostatic test water and dust abatement are discussed in section 4.3.2.5. Table 4.3.1-3 presents each water source and the estimated volume of water that Ruby plans to appropriate from each well.

TABLE 4.3.1-3

Proposed Hydrostatic Test Water and Dust Control Groundwater Sources for the Ruby Pipeline Project

State	MP	Water Source	Hydrostatic Test Water Volume (gallons)	Dust Control and Alternate Hydrostatic Test Water Volume (gallons)	Total Volume to be Appropriated (gallons)
Utah	50.5	Hopkins Well		1,680,000	1,680,000
	54.9	Schulthess Well		1,680,000	1,680,000
	70.1	Monte Cristo Well		3,360,000	3,360,000
	78.4	Well (Proposed)[b]		1,680,000	1,680,000
	105.5	Brigham City Hydrant 1		1,680,000	1,680,000
	106.9	Brigham City Hydrant 2		1,680,000	1,680,000
	107.4	Brigham City Hydrant 3[a,d]	4,247,438	1,680,000	5,927,438
	142.3	Well[b]		1,680,000	1,680,000
	161.3	Locomotive Spring Well 2		1,680,000	1,680,000
	172.7	Wild Cat Hills Well[a,d]	34,774,981	1,680,000	36,454,981
	182.3	BLM Well		1,680,000	1,680,000
	200.3	Arimo Ranch Well 1		3,360,000	3,360,000
	207.2	Arimo Ranch Well 2		1,680,000	1,680,000
	206.1	Arimo Ranch Well 3		1,680,000	1,680,000
	210.2	Arimo Ranch Well 4		1,680,000	1,680,000
	219.6	Grouse Creek Ranch Well		3,360,000	3,360,000
Nevada	239.2	Walker Wine Cup Well 1[a,d]	19,294,450	1,680,000	20,974,450
	238.7	Walker Wine Cup Well 2		3,360,000	3,360,000
	247.9	Walker Wine Cup Well 3		3,360,000	3,360,000
	257.1	Walker Wine Cup Well 3		1,680,000	1,680,000
	268.1	Walker Wine Cup Well 3		1,680,000	1,680,000
	278.2	Walker Wine Cup Well 3		1,680,000	1,680,000
	293.2	Tabor Ranch Well 1[d]	38,869,645	1,680,000	40,549,645
	297.8	Well[b]		1,680,000	1,680,000
	312.5	Well[b]		1,680,000	1,680,000
	330.2	Wieland Flat Compressor Station[c]	500,000	1,680,000	2,180,000
	337.3	Well[b]		1,680,000	1,680,000
	350.1	Well[b]		1,680,000	1,680,000
	357.8	Well[b]		1,680,000	1,680,000
	366.4	Well[b]		1,680,000	1,680,000
	377.9	Barrick Well[a,d]	18,574,438	1,680,000	20,254,438
	389.2	BLM Well[c]		1,680,000	1,680,000
	390.0	Well[b]		1,680,000	1,680,000
	406.2	Crawford Well		1,680,000	1,680,000
	416.0	Christinson Well	26,958,307	1,680,000	28,638,307
	422.1	Crawford Well		1,680,000	1,680,000
	435.3	Winnemucca Farms Well[a]		1,680,000	1,680,000
	439.4	Walter Vetter Well		1,680,000	1,680,000
	450.8	Leon Frey Well		2,520,000	2,520,000
	463.1	Donna Harber Well		1,680,000	1,680,000
	476.3	Desert Valley Compressor Station	500,000		500,000

TABLE 4.3.1-3

Proposed Hydrostatic Test Water and Dust Control Groundwater Sources for the Ruby Pipeline Project

State	MP	Water Source	Hydrostatic Test Water Volume (gallons)	Dust Control and Alternate Hydrostatic Test Water Volume (gallons)	Total Volume to be Appropriated (gallons)
	479.3	Happy Creek Ranch Well		2,520,000	2,520,000
	486.6	Quinn River Ranch Well		1,680,000	1,680,000
	502.6	Pine Forest Ranch Well[a,d]	15,106,107	2,520,000	17,626,107
	507.6	BLM Well 3		1,680,000	1,680,000
	522.8	Kudrna Ranch Well		1,680,000	1,680,000
	532.8	Kudrna Ranch Well[c]		1,680,000	1,680,000
	545.8	Double Horseshoe Drill Well[a,c]	7,903,929	1,680,000	9,583,929
	558.3	Top Dog Ranch Well		1,680,000	1,680,000
	558.5	Top Dog Ranch Well		1,680,000	1,680,000
	561.3	Smith Ranch Well		1,680,000	1,680,000
	568.0	Fitzgerald Well		1,680,000	1,680,000
	572.5	Alice Gladwill Drill Well[a]	14,278,780	1,680,000	15,958,780
	579.6	BLM Well[c]		1,680,000	1,680,000
Oregon	588.7	Don Robinson Well		1,680,000	1,680,000
	601.9	Don Robinson Proposed Drill Well[a,c]	9,167,080	1,680,000	10,847,080
	607.8	Lakeview Fairground Well		1,680,000	1,680,000
	613.8	Adair Brown Well		1,680,000	1,680,000
	617.2	Bud Garrett Well[a,d]	7,830,060	1,680,000	9,510,060
	639.2	Goose Lake Timber Company Drill Well[a]	5,510,590	1,680,000	7,190,590
	653.5	Philip Grohs Well[a,c]		1,680,000	1,680,000
	662.4	Frank Hammerich Well		1,680,000	1,680,000
	669.2	Mike Burns Well		1,680,000	1,680,000
	0.1$_{\ell}$	Eric Sturm Well[a,d]	17,602,860	1,680,000	19,282,860
		Total	**221,118,665**	**116,760,000**	**337,878,665**

a This water source would be used for dust abatement and hydrostatic testing.
b Ruby anticipates that a new well would be drilled at this location, but the property owner has not yet been identified.
c Ruby is proposing to drill a new well at this location.
d Water source would require construction of temporary hard piping from well to project site.

Ruby has proposed to procure about 221.1 million gallons of water for hydrostatic testing and about 116.7 million gallons of water for dust control from these wells. An additional small amount of water would also be used for cleaning and disinfecting construction equipment. Equipment cleaning/disinfection is necessary as equipment moves between the 25 8-digit HUC watersheds (see section 4.6.2), when equipment leaves the Little Bear River watershed (see section 4.6.2), as equipment enters the Sheldon NWR (see section 4.4.6), and as equipment leaves contractor yards. Ruby has estimated that about 2,000 gallons of water would be required to clean 10 equipment vehicles at required cleaning and disinfection locations. In total, it is estimated that Ruby would use less than 100,000 gallons of water to clean and disinfect equipment. Ruby would obtain water for dust control from sources identified in table 4.3.1-3. Ruby would not use water from springs for construction purposes.

We received numerous comments expressing concern that appropriation of groundwater for hydrostatic testing and dust control could cause detrimental effects to the area's limited water resources. Our review of data published by the National Drought Mitigation Center has revealed that portions of Wyoming, Utah, Nevada, and southern Oregon are currently experiencing drought conditions. Therefore, the use of groundwater for construction purposes has the potential to impact the already limited water supply in these areas. Ruby has applied for the temporary use of water rights for water sources in all four states crossed by the project (see table 1.5-1). Each state's water right permitting process for the project involves a review of Ruby's proposed water sources, points of withdrawal, places of use, and water volumes to determine whether the use would adversely impact existing water users and the state's water resources. Each state would determine whether water is available in the quantity that Ruby is seeking. Any appropriation of groundwater would be subject to conditions imposed by the state engineer to minimize impacts on the aquifer from which water is appropriated. Ruby would only utilize water sources identified in table 4.3.1-3 that are authorized and approved by the respective state water right permitting agencies, and Ruby must comply with any limitations or conditions on withdrawal imposed by these agencies. If groundwater appropriation sites change, Ruby would be required to find an alternate groundwater source that is acceptable/permittable by each state's engineering office. In addition, if water resources are fully appropriated, Ruby would negotiate with water right holders to allow Ruby to file for a temporary change of use from the landowner to Ruby; otherwise, the source could not be used. If groundwater is not available at a given location, Ruby would need to make other arrangements (*i.e.,* trucking in water from approved sources) to obtain water needed for construction activities.

Ruby modified its Hydrostatic Test Plan in November 2009 to describe how it proposes to convey water from wells to the project for hydrostatic testing and dust control. All water used for dust control would be conveyed from the source well to the project site in trucks. Ruby is requesting an approximate 200-foot by 200-foot site from the landowner at each point of appropriation to allow the water trucks to be filled and to turn around. Table 4.3.1-3 lists eight well locations identified by Ruby that would require temporary hard piping to move water to the project site for hydrostatic testing. Ruby has stated that the majority of the temporary hard piping would be laid on the surface of the ground on private property. The exceptions are the piping from the Brigham City Hydrant #3 (MP 107.4), which would be on both city and private property, and Wildcat Hill (MP 172.7), which would be laid within a Box Elder County Road (CR) right-of-way. Little or no surface disturbance would be required to lay water pipe on the ground, and associated impacts are expected to be negligible.

Ruby completed a review of each proposed groundwater source to determine if the water is free of contaminants. Ruby completed its assessment by querying each permitting agency's available well data and maps for known points of contamination. Based on this review, Ruby has confirmed that the proposed hydrostatic test and dust abatement groundwater sources are not known to be contaminated.

After hydrostatic testing, water would be discharged to the ground through an energy dissipation/filtration device. The energy dissipation/filtration device serves as a temporary sediment pond

allowing discharged water to infiltrate into the groundwater near the location of discharge, helping to restore groundwater conditions and to eliminate flow into existing surface waterbodies.

The volumes of groundwater to be appropriated for hydrostatic testing and dust abatement are estimated at 338 million gallons, which is substantially more than the 66 million gallons originally identified by Ruby and evaluated by us in the draft EIS. Because the volume of water is considerable and the project is located in a region of the country where water resources are limited, we believe that appropriating water of this volume could result in a significant impact. We assert, however, that water rights are a complex issue and that permission to appropriate water in reasonable quantities would be handled by each state's engineering office. Water use during operation, however, would not be substantial and no significant impacts on groundwater are anticipated during the operational phase of the pipeline.

A comment was received that the Vya Construction Camp could have an impact on area groundwater resources. Ruby assessed the Vya camp location and determined that the camp is not located in a designated groundwater basin of Nevada and that there are no wellhead protection areas at or near the location of the Vya camp. As such, the underlying groundwater resources are not considered depleted nor require additional administrative action. One 400-foot-deep well currently exists on the camp site. This well is located in a basin-fill aquifer comprised of unconsolidated sands and gravel. The well would be used as the camp's potable water supply. Ruby's permit for this well has been reviewed and approved by the State of Nevada Division of Water Rights, and "Ready for Action" status has been conveyed for the well's use. The estimated volume of water to be appropriated on a daily basis is 18,000 gallons for the duration of the camp's use (8 to 10 months). The source aquifer for this water supply is expected to provide a good yield and impacts on other area wells is not anticipated. Based on the hydrogeologic setting and planned activities for the camp, impacts on hydrogeologic resources would be considered short-term and insignificant.

Ruby's Lakeview Temporary Housing Facility would utilize existing municipal sewer and water services. Ruby has found no recorded wells within 1,500 feet of the proposed site. Logs from test pits completed on site did not report groundwater within 4 feet of the ground surface, although groundwater is believed to be within at least 15 feet of the surface. Based on the proposed site use and hydrogeologic setting, impacts on groundwater resources would be considered negligible.

4.3.2 Surface Waters

The Ruby Pipeline Project would cross 11 major watershed basins (see figure 4.3.2-1). Basin descriptions and approximate locations are provided in table 4.3.2-1.

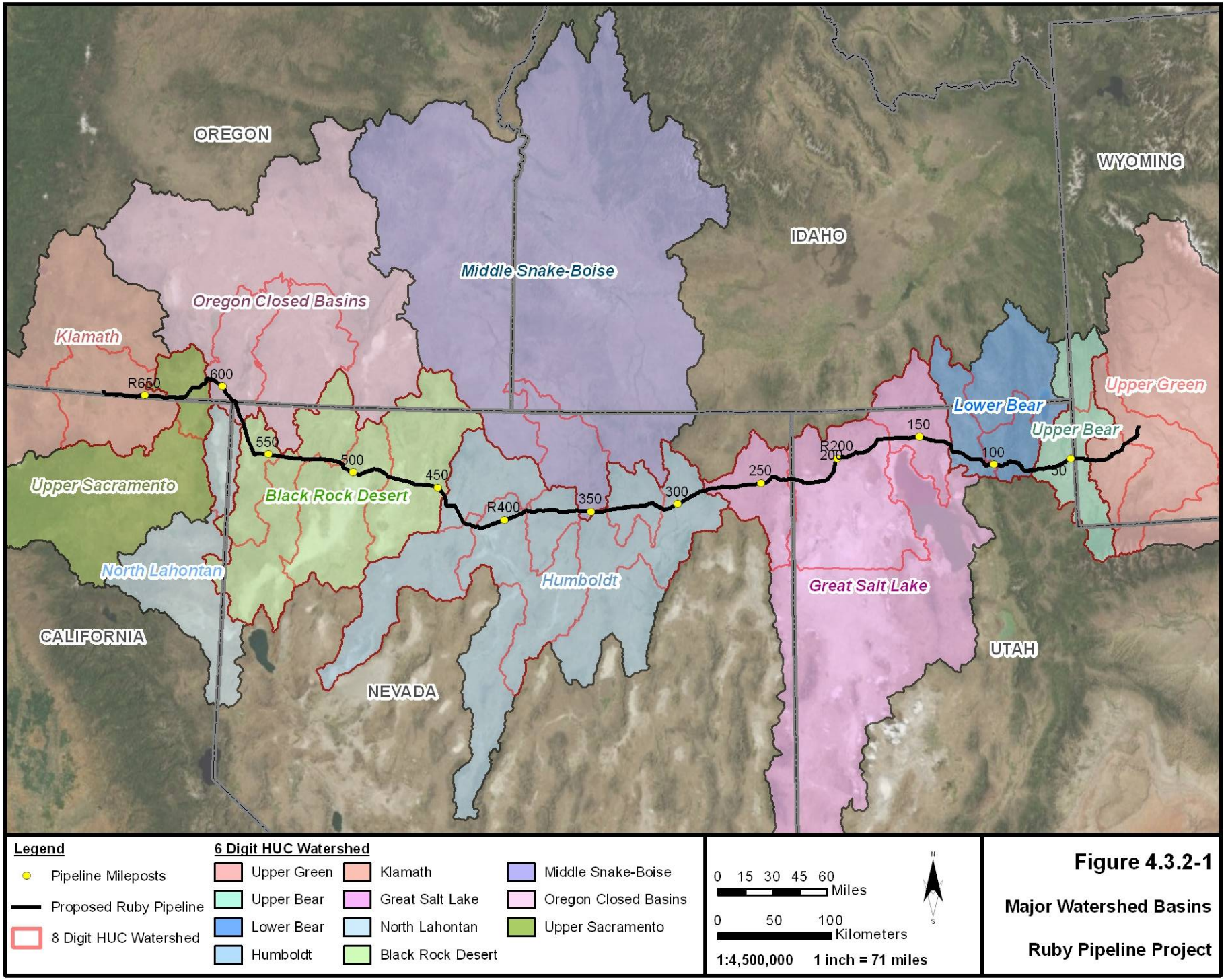

Figure 4.3.2-1

Major Watershed Basins

Ruby Pipeline Project

TABLE 4.3.2-1

Major Watershed Basins Crossed by the Ruby Pipeline Project

Watershed Basin	Approximate MP Range	Description
Upper Green	0 – 40	The Upper Green Watershed has a drainage area of about 17,600 square miles and is located in southwest Wyoming, northwest Colorado, and northeast Utah. The Green River originates in the Wind River Mountains of west-central Wyoming and flows about 190 miles south where it drains into the Flaming Gorge Reservoir. The Green River is a main tributary to the Colorado River.
Upper Bear	40 – 73	The Upper Bear Watershed has a drainage area of about 2,826 square miles and is located in southwest Wyoming, southeast Idaho, and northeast Utah. The Bear River originates in the Uinta Mountains and flows about 193 miles north through this watershed before entering the Lower Bear Watershed. The Cokeville Meadows NWR and Bear River State Park are located along the Bear River in Wyoming.
Lower Bear	73 – 131	The Lower Bear Watershed has a drainage area of about 7,463 square miles and is located in southeast Idaho and northeast Utah. The Bear River flows about 157 miles through this watershed before draining into the Bear River Migratory Bird Refuge and the Great Salt Lake. The Malad River is a major tributary to the Bear River.
Great Salt Lake	131 – 282	The Great Salt Lake Watershed has a drainage area of about 18,000 square miles and is located in northern Utah. It is located in the most arid region of Utah. Three major rivers originate in the western end of the Uinta Mountains and drain into the Great Salt Lake: the Bear, the Weber, and the Provo/Jordan. The Bonneville Salt Flats are located in the western portion of this watershed.
Humboldt	282 – 348; R356 – 444	The Humboldt Watershed has a drainage area of about 18,670 square miles and is located in north-central Nevada. The 300-mile Humboldt River drains in to the intermittent dry lake bed of Humboldt Lake. The source of the river is Humboldt Wells spring at the northern tip of the East Humboldt Range, just outside the city of Wells.
Middle Snake – Boise	348 – R356	The Middle Snake – Boise Watershed has a drainage area of about 35,900 square miles and is located in north-central Nevada, southeast Oregon, and southwest Idaho. The 1,040-mile-long Snake River originates in Yellowstone Park and meanders through mountain ranges, canyons, and plains to its confluence with the Colombia River. The Boise River is a 75-mile-long tributary of the Snake River that drains a rugged portion of the Sawtooth Range northeast of Boise, as well as part of the western Snake River Plain.
Black Rock Desert	444 – 542.6 542.7 – 575.0	The Black Rock Desert Watershed has a drainage area of about 13,130 square miles and is located in northwest Nevada. The Black Rock Desert is the dry lake bed of prehistoric Lake Lahontan, which existed between 18,000 and 7,000 BC during the last ice age. This watershed is a closed basin where waterbodies water generally end at a sink and evaporate.
North Lahontan	575 – 575.3	The North Lahontan Watershed has a drainage area of about 5,187 square miles and is located in northeast California and northwest Nevada. Water drains to Upper Lake in the Surprise Valley in the project area.
Oregon Closed Basins	542.6 – 542.7 575.3 – 610.0	The Oregon Closed Basins Watershed has an area of about 19,500 square miles and is located in south-central Oregon. Surface waters in this watershed drain to inland terminal locations such as lakes and sinks where water evaporates or seeps into the ground. Where the water evaporates, high concentrations of minerals such a salts remain, resulting in an alkaline environment.
Upper Sacramento	610 – 639	The Upper Sacramento Watershed has an area of about 8,800 square miles and is located in northeastern California and south-central Oregon. The Sacramento River flows south for 447 miles through the northern Central Valley of California, between the Pacific Coast Range and the Sierra Nevada and finally drains into the northern arm of San Francisco Bay. The Pit River is the principal northern tributary to the Sacramento River. Goose Lake was the regular source of water for the Pit River but water diversion has caused the lake level to drop below its outlet.
Klamath	639 – R672.6	The Klamath Basin Watershed is located on the Oregon and California border, and covers slightly more than 10 million acres, including approximately 6.1 million acres of public land and 3.8 million acres of private land. These private lands include more than 2,400 farms and ranches on 581,000 acres. The proposed project would pass through the Lost River Sub Basin are which is comprised of approximately 1,926,303 acres covering a portion of Klamath, Modoc, and Siskiyou counties.

The project would cross 1,069 waterbodies. Appendix Q lists the location, name, type, fishery classification, state water quality/use classification, and impaired water quality designation for all waterbodies that would be crossed by the project. A summary is provided in table 4.3.2-2. There are no waterbodies within or immediately adjacent to the boundaries of the proposed aboveground facility sites.

TABLE 4.3.2-2

Summary of Surface Waterbodies Crossed by the Ruby Pipeline Project

State/County	Perennial Waterbody	Intermittent Waterbody	Ephemeral Waterbody	Total
WYOMING				
Lincoln	4	14	19	37
Uinta	2	7	19	28
UTAH				
Rich	3	16	2	21
Cache	12	5	3	20
Box Elder	20	69	172	261
NEVADA				
Elko	36	39	150	225
Humboldt	7	11	87	105
Washoe	-	4	21	25
OREGON				
Lake	27	39	42	108
Klamath	6	8	4	18
Total	**117**	**212**	**519**	**848**

a 1,069 waterbodies (including streams, washes, swales, drainages, seeps, springs, lakes, ponds, canals, and ditches) would be crossed by the project. Of these, 221 waterbodies have unknown flow characteristics and are not presented in this table (but are included in Appendix Q).

4.3.2.1 State Water Classifications

CWA Section 303(d) requires that each state review, establish, and revise water quality standards for all surface waters within each state. Each state has developed its own beneficial use classification system to describe state-designated uses to comply with this requirement. These classification systems assist each state in developing monitoring and mitigation programs to ensure that waters attain the standards they are designated. Waters that fail to meet their designated beneficial uses are considered impaired and are listed under a state's 303(d) list of impaired waters. Water use classifications for each state crossed by the project are summarized in the following sections. Potable water intakes within 3 miles downstream of waterbody crossings are presented in table 4.3.2-3.

TABLE 4.3.2-3

Potable Water Intakes Within 3 Miles Downstream of Waterbody Crossings Along the Ruby Pipeline Project

State/County	Approximate MP	Waterbody Name	Water Use	Approximate Distance Downstream of Pipeline Crossing (miles)
UTAH				
Rich	51.8	Bear River	Domestic, Irrigation, Stock	1.7
Rich	R52.0	Bear River	Domestic, Irrigation, Stock	1.7
Rich	R54.1	Tributary to Woodruff Creek	Domestic, Stock	0.02
Rich	R54.6	Woodruff Creek	Domestic	1.5
Rich	R54.7	Tributary to Woodruff Creek	Domestic, Irrigation, Stock	0.2
Rich	60.0	Woodruff Creek	Domestic, Irrigation	2.2
Rich	60.0	Woodruff Creek	Domestic, Irrigation	2.1
Rich	60.0	Woodruff Creek	Domestic, Irrigation	2.0
Rich	60.6	Woodruff Creek	Domestic, Irrigation	2.6
Rich	60.6	Woodruff Creek	Domestic, Irrigation	2.5
Rich	60.6	Woodruff Creek	Domestic, Irrigation	2.4
Rich	60.8	Woodruff Creek	Domestic, Irrigation	2.3
Rich	60.8	Woodruff Creek	Domestic, Irrigation	2.2
Rich	60.8	Woodruff Creek	Domestic, Irrigation	2.1
Rich	61.4	Woodruff Creek	Domestic, Irrigation	2.79
Cache	87.1	Unnamed	Domestic, Stock	0.01
Cache	92.7	East Fork Bear River	Domestic, Irrigation, Other, Stock	1.5[a]
Cache	92.7	East Fork Bear River	Domestic, Irrigation, Stock	1.5[a]
Cache	93.5	East Fork Bear River	Domestic, Irrigation, Other, Stock	1.1[a]
Cache	93.5	East Fork Bear River	Domestic, Irrigation, Other, Stock	1.1
Cache	93.5	East Fork Bear River	Domestic, Irrigation, Stock	1.1[a]
Cache	93.5	East Fork Bear River	Domestic, Irrigation, Stock	1.1
Cache	93.5	East Fork Bear River	Domestic, Irrigation, Stock	1.1
Cache	93.5	East Fork Bear River	Domestic, Irrigation, Stock	1.1
Cache	92.7	East Fork Bear River	Domestic, Irrigation, Other, Stock	2.4
Cache	97.7	East Fork Bear River	Domestic, Irrigation, Other, Stock	2.4
Cache	93.5	East Fork Bear River	Domestic, Irrigation, Other, Stock	2.0[a]
Cache	92.7	East Fork Bear River	Domestic, Irrigation, Stock	1.5
Cache	93.5	East Fork Bear River	Domestic, Irrigation, Stock	1.1

TABLE 4.3.2-3

Potable Water Intakes Within 3 Miles Downstream of Waterbody Crossings Along the Ruby Pipeline Project

State/County	Approximate MP	Waterbody Name	Water Use	Approximate Distance Downstream of Pipeline Crossing (miles)
Cache	92.7	East Fork Bear River	Domestic, Irrigation, Stock	1.5
Cache	93.5	East Fork Bear River	Domestic, Irrigation, Stock	2.0
Cache	97.7	East Fork Bear River	Domestic, Irrigation, Other, Stock	2.4
Cache	93.5	East Fork Bear River	Domestic, Irrigation, Other, Stock	2.0
Cache	92.7	East Fork Bear River	Domestic, Irrigation, Stock	2.4
Cache	93.5	East Fork Bear River	Domestic, Irrigation, Stock	2.0
Cache	94.7	Little Bear River	Domestic, Irrigation, Other, Stock	0.28[a]
Cache	94.9	Little Bear River	Domestic, Irrigation, Other, Stock	0.1[a]
Cache	94.4	Little Bear River	Domestic, Irrigation, Other, Stock	0.4[a]
Cache	98.4	West Fork Little Bear River	Domestic, Irrigation	2.7
Box Elder	107.8	Tributary to North Spring Irrigation Ditch	Domestic, Irrigation, Stock	0.02[a]
Box Elder	109.0	North Spring Irrigation Ditch	Domestic, Irrigation	0.18
Box Elder	109.0	North Spring Irrigation Ditch	Domestic, Irrigation, Stock	0.18
NEVADA				
Humboldt	508.6	Tributary to Great Salt Lake	Domestic	2.4
OREGON				
Lake	629.9	Tributary to Goose Lake	Irrigation, Domestic	2.4

a Location has more than one potable water intake at that specific location downstream of the proposed waterbody crossing.

Wyoming

The state of Wyoming classifies surface waters into six uses and four classes. Surface water uses are agriculture, protection and propagation of fish and wildlife, industry, human consumption, recreation, and scenic value. Designated classifications are Class 1 – outstanding waters; Class 2 – fisheries and drinking water; Class 3 – aquatic life other than fish; and Class 4 – agriculture, industry, recreation, and wildlife. These classifications are designed for conservation, protection, maintenance, and improvement of water quality for public water supplies; for the propagation of wildlife, fish, and aquatic life; and for domestic, agricultural, industrial, recreational, and other legitimate beneficial uses.

None of the waterbodies that would be crossed in Wyoming are on the 303(d) list of impaired waters. No potable water intake sources have been identified within 3 miles downstream of any of the proposed waterbody crossings in Wyoming.

Utah

The state of Utah designates five major management and protection classifications to surface waters (UDWQ, 2006); Class 1 – raw water source for domestic water systems; Class 2 – recreational use and aesthetics; Class 3 – aquatic wildlife; Class 4 – agricultural use including irrigation and stock watering; and Class 5 – primary and secondary contact recreation, aquatic wildlife, and mineral extraction for the Great Salt Lake. These classifications are designated to protect waters for drinking, fishing, boating, irrigation, stock watering, aquatic wildlife, and other legitimate beneficial uses.

One of the waterbodies that would be crossed in Utah is on the 303(d) list of impaired waters. A tributary to Saleratus Creek (MP R54.6) has failed to meet its designated beneficial use criteria for dissolved oxygen. Sixty-nine potable water intake sources have been identified within 3 miles downstream of the proposed waterbody crossings in Utah (see table 4.3.2-3). The majority of these intakes are for domestic uses.

Nevada

The state of Nevada assigns the following beneficial uses to classified waters: aquatic life, wildlife propagation, recreation involving water contact, recreation not involving water contact, municipal drinking supply, stock watering, irrigation, and industrial supply.

Five of the waterbodies that would be crossed in Nevada are on the 303(d) list of impaired waters (see table 4.3.2-4). One potable water intake source has been identified within 3 miles downstream of the proposed waterbody crossings in Nevada (see table 4.3.2-3).

TABLE 4.3.2-4

303(d)-Listed Waterbodies in Nevada Crossed by the Ruby Pipeline Project

County	Approximate MP	Waterbody Name	Parameter Exceeded
Elko	300.1	Mary's River	Dissolved Oxygen, Total Phosphorus, Temperature
Elko	315.2	Indian Creek	Total Phosphorus
Elko	316.4	North Fork Humboldt River	Total Phosphorus
Elko	R362.6	Willow Creek	Total Phosphorus
Humboldt	432.6	Little Humboldt River	Total Phosphorus

Oregon

The state of Oregon assigns the following beneficial uses to classified waters: domestic water supply, fishing, industrial water supply, boating, irrigation, water contact, recreation, livestock watering, aesthetic quality, fish and aquatic life, hydropower, wildlife and hunting, and commercial navigation and transportation.

Eight of the waterbodies that would be crossed in Oregon are on the 303(d) list of impaired waters (see table 4.3.2-5). One potable water intake source has been identified within 3 miles downstream of the proposed waterbody crossings in Oregon (see table 4.3.2-3). The intake is used for a combination of domestic, livestock, and irrigation uses.

TABLE 4.3.2-5

303(d)-Listed Waterbodies in Oregon Crossed by the Ruby Pipeline Project

County	Approximate MP	Waterbody Name	Parameter Exceeded
Lake	588.3	Twelvemile Creek	Silver, Temperature, Arsenic
Lake	596.0	Twentymile Creek	Silver, Temperature, Arsenic, Dissolved Oxygen
Lake	601.8	Deep Creek	Temperature
Lake	605.4	Horse Creek	Temperature
Lake	R620.2	Thomas Creek	Temperature, Iron, Dissolved Oxygen
Lake	642.5	North Fork Willow Creek	Temperature
Lake	R651.9	Rock Creek	Temperature
Klamath	R665.2	Lost River	Dissolved Oxygen, Chlorophyll a, Ammonia

4.3.2.2 Sensitive Waterbodies

Waterbodies may be considered sensitive for a number of reasons including, but not limited to: size, the presence of coldwater fish species or special status species, the presence of high-quality recreational or visual resources, historic value, or the presence of impaired water or contaminated sediments.

The project would cross 83 waterbodies that are considered sensitive because of the presence of special status species. Mitigation measures to avoid or minimize impacts on special status species within these waterbodies are discussed in section 4.7.

As discussed in section 4.3.2.1, the project would cross 14 waterbodies designated as impaired waters. Phosphorus, temperature, and dissolved oxygen appear to be the most common impairments. Parameters for silver, arsenic, iron, and ammonia have also been exceeded in five Oregon streams.

The project would not cross any designated WSRs. However, the project would cross Twelvemile Creek, which has been proposed for designation as a WSR. The Lakeview RMP determined that approximately 4.4 miles of Twelvemile Creek in Oregon is suitable for designation by Congress as a WSR and that management standards and guidelines for a Recreational classification should be followed in the interim. A Recreational designation is given to those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. Under a Recreational designation, rights-of-way for pipelines are avoided or restricted to existing rights-of-way. Ruby has proposed to locate the pipeline

adjacent to an existing power line right-of-way where the project crosses Twelvemile Creek. Ruby stated that it would implement the interim management guidelines and standards for Wild, Scenic, and Recreational classifications as specified in the Lakeview RMP. The management standards emphasize fisheries as its primary outstanding remarkable value. Ruby would submit a detailed stream crossing plan for Twelvemile Creek to the ODFW for review. Ruby has filed a crossing plan for Twelvemile Creek with the FERC (we assess the adequacy of this crossing plan in section 4.7.2.4). Ruby would cross Twelvemile Creek using a dry-ditch crossing method and implement the timing restrictions presented in table 2.3.2-1.

4.3.2.3 Potential Surface Water Impacts

Pipeline construction could affect surface waters in several ways. Clearing and grading of stream banks, in-stream trenching, trench dewatering, and backfilling could result in modification of aquatic habitat, increased sedimentation, turbidity, decreased dissolved oxygen concentrations, releases of chemical and nutrient pollutant from sediments, and introduction of chemical contaminants such as fuel and lubricants. The use of surface waters and groundwater for hydrostatic testing, dust abatement, and vehicle washing could directly or indirectly affect surface water volumes. The crossing of irrigation canals could interrupt the flow of irrigation water, which could damage crops and reduce crop yields.

Downstream sedimentation is a primary concern during in-stream construction. The extent of sedimentation impacts would depend on sediment loads, stream velocity, turbidity, bank composition, and sediment particle size. In-stream construction could cause the dislodging and transport of channel bed sediments and the alteration of stream contours. Changes in the bottom contours could alter stream dynamics and increase downstream erosion or deposition, depending on circumstances. Turbidity resulting from resuspension of sediments from in-stream construction or erosion of cleared right-of-way areas could reduce light penetration and photosynthetic oxygen production. In-stream work also could introduce chemical and nutrient pollutants from sediments. Resuspension of deposited organic material and inorganic sediments could cause an increase in biological and chemical use of oxygen, potentially resulting in a decrease of dissolved oxygen concentrations in the affected area. Lower dissolved oxygen concentrations could cause temporary displacement of motile organisms, such as fish, and may kill non-motile organisms within the affected area.

The clearing and grading of streambanks would expose soil to erosional forces and would reduce riparian vegetation along the cleared section of the waterbody (see section 4.4.3 for a discussion of riparian habitat). The use of heavy equipment for construction would cause compaction of near-surface soils, an effect that could result in increased runoff into surface waters. The increased runoff could transport additional sediment into the waterbodies, resulting in increased turbidity levels and sedimentation rates in the receiving waterbody. Disturbances to stream channels and streambanks could increase the likelihood of scour after construction.

Refueling of vehicles and storage of fuel, oil, or other hazardous materials near surface waters could create a potential for contamination. If a spill were to occur, immediate downstream users of the water could experience degradation in water quality. Acute and chronic toxic effects to aquatic organisms could also result from such a spill.

Blasting may be required in Utah, Nevada, and Oregon in locations of shallow bedrock from MP 57.5 to the terminus of the project, and could include blasting within streams and wetlands. In-stream blasting has the potential to injure or kill aquatic organisms, displace organisms during blast-hole drilling operations, and temporarily increase stream turbidity. Byproducts from the blast could also be released and could potentially contaminate the water. To minimize or avoid these impacts, Ruby would comply with all instream blasting permit requirements and would avoid blasting in sensitive streams during

critical periods (see table 2.3.2-1). In Oregon, a permit would be required for use of explosives on, under, in, or adjacent to waters of the State of Oregon that could impact fish, wildlife, or their habitat (OAR 635-425-000).

An ephemeral waterbody flows east to west across the Vya Construction Camp site. On October 29, 2009, Ruby submitted a layout design of the Vya camp. The design of the camp indicates all camp facilities, including the helicopter pad, offices, and fuel storage area, would be located north of the ephemeral waterbody. Therefore, direct impacts on the ephemeral waterbody would be avoided. Ruby would be required to comply with state stormwater discharge requirements which would ensure that indirect impacts on the waterbody would also be avoided.

A manmade flood diversion channel is located approximately 200 feet north of the Lakeview Temporary Housing Facility. This channel is bermed to keep water from spreading across the adjacent landscape, which includes the project area. Given the channel's periodic connectivity to Warner Creek (which ultimately flows into Goose Lake), it is likely this hydrologic feature would fall under COE jurisdiction pursuant to Section 404 of the CWA. Accordingly, the Lakeview facility would be constructed and operated in a manner to avoid discharges of fill material into the channel. Based on the Federal Emergency Management Administration (FEMA) floodplains maps, the lodging facility site is within a 100-year floodplain (FEMA, 2009). Ruby has stated project construction and operation would comply with all relevant FEMA regulations as well as Town of Lakeview (Lakeview Development Code, Chapter 3.7), Lake County (Lake County Comprehensive Plan, Part VIII) floodplain development requirements, and state stormwater discharge requirements.

4.3.2.4 Waterbody Construction and Mitigation Procedures

Ruby has proposed to use several different waterbody crossing methods depending on site- and waterbody-specific conditions. The majority of the waterbodies that would be crossed by the pipeline are intermittent drainages and washes that are expected to be dry at the time of construction. These waterbodies do not typically support fisheries or provide critical aquatic habitat or migratory passage for aquatic organisms. Ruby has proposed to cross waterbodies and canals that are dry at the time of the crossing using conventional upland construction methods (see section 2.3.1). Ruby would continue to place excavated trench material a minimum of 10 feet from the high water mark of the waterbody where upland construction methods are utilized. If a rain event were to occur and the waterbody begins to flow, Ruby would implement standard waterbody crossing techniques such as installation of erosion control devices, temporary bridges, or flumes, and would limit the duration of the crossing as described in its Procedures. When water is present in canals and ditches that are set into the ground, an open-cut crossing method would be implemented. Trench plugs may be used within the excavated trench to prevent water from flowing laterally along the excavated trench. When canal or ditch banks are built up, the pipe would be installed using the horizontal bore method.

Ruby would utilize the open-cut crossing method (see section 2.3.2.2) at waterbodies that are inundated or flowing at the time of construction <u>and</u> do not contain special status species. Based on Ruby's data, roughly 75 streams would be crossed using this method. Ruby would minimize impacts on waterbodies during open-cut construction by implementing measures contained in its Procedures, which include:

- locating temporary extra workspaces at least 50 feet from surface waters except where adjacent upland is actively farmed or developed or where approved by the FERC and appropriate agencies;
- limiting clearing of vegetation between temporary extra workspaces and the edge of the waterbody to preserve riparian vegetation;

- constructing the crossing as close to perpendicular to the waterbody as site conditions allow;
- maintaining adequate flow rates throughout construction to protect aquatic life and prevent the interruption of existing downstream uses;
- locating equipment parking areas, equipment refueling areas, concrete coating activities, and hazardous material storage at least 100 feet from surface waters, unless unfeasible;
- locating equipment parking areas and refueling areas at least 500 feet from surface waters on BLM-administered land, unless infeasible;
- requiring construction across waterbodies to be completed as quickly as possible and during the windows specified in the Procedures or required by applicable permits;
- developing and adhering to any required site-specific construction plan for each waterbody greater than 100 feet wide at the crossing location (major waterbody);
- requiring temporary erosion and sediment control measures to be installed across the entire width of the construction right-of-way after clearing and before ground disturbance;
- requiring maintenance of temporary erosion and sediment control measures throughout construction until streambanks and adjacent upland areas are stabilized;
- requiring bank stabilization and reestablishment of bed and bank contours and riparian vegetation after construction;
- maintaining a 25-foot-wide strip of riparian vegetation along the waterbody and restricting maintenance of vegetation to a 10-foot-wide strip centered over the pipeline to trees greater than 15 feet in height within 15 feet of the pipeline centerline;
- consulting with the appropriate land managing or state agencies to develop plans for restoring vegetation, and, where necessary, preventing the invasion or spread of undesirable exotic and invasive vegetation;
- monitoring the success of vegetation restoration annually for a period of at least 5 years after construction, <u>or until the waterbody banks are successfully revegetated</u>; and
- implementing the Spill Plan if a spill or leak occurs during construction.

Ruby has stated that it would cross all flowing waterbodies with the potential to contain special status fish species using a dry-ditch crossing method. Dry-ditch waterbody crossing methods generally result in less sedimentation and turbidity in and downstream of the project area. The dry-ditch crossing method involves diverting the flow of water across the work area using water pumps (dam-and-pump method) or through flume pipes (flume method). (See section 2.3.2.2 for a description of waterbody crossing techniques). The use of such methods is generally restricted to waterbodies less than 30 feet wide as it is typically considered infeasible to use such methods on wider crossings; the wider the waterbody the more difficult it is to get a good seal for the dam or around the flume pipes. Ruby would also construct stream crossings during windows established by state agencies and the FERC to protect fishery resources (see table 2.3.2-1). Ruby also would adopt additional measures based on any state agency permitting requirements.

In addition to streams that contain special status species, the WGFD recommended that the Hams Fork River and Little Muddy Creek be bored to reduce impacts on downstream aquatic resources. While this method would substantially minimize impacts on waterbodies, the amount and depth of ground disturbance required to excavate a bore hole, stage boring equipment, and store the excavated soil adjacent to the waterbody would be considerable. Ruby has proposed to cross the Hams Fork River using a HDD, and the Little Muddy Creek using a dry-ditch crossing method. We believe that these crossing methods would reduce sedimentation from construction activities to a level that would not threaten downstream fish populations and recreational opportunities. Therefore, we concur with Ruby's proposed crossing methods for the Hams Fork River and Little Muddy Creek.

The ODFW recommended that all perennial streams in Oregon be crossed using a dry-ditch method. Additionally, fish passage regulations in Oregon require construction activities to allow fish to pass across the construction work area. Ruby has proposed to use a dry-ditch crossing method to cross all flowing streams that are known to contain special status fish in Oregon. However, the Lost River (MP R665.2, which is 360 feet wide at the proposed pipeline crossing location, would likely be crossed using the wet open-cut crossing method, although Ruby has not indicated how it proposes to cross the waterbody. As stated above, a dry-crossing method is generally restricted to waterbodies less than 30 feet wide as it is typically considered infeasible to use this method on wider crossings. Because a dam-and-pump crossing method likely would prevent fish from passing through the construction workspace (contrary to the ODFW requirements), we expect that the ODFW would require a flume crossing method in Oregon wherever a dry-ditch crossing is warranted. The ODFW would review Ruby's fish passage plans and crossing methods for adequacy and compliance with state requirements.

Ruby stated it would cross the Hams Fork River and the two Bear River crossings using the HDD method. Ruby states it would consider using HDD in other locations if construction were required outside an in-stream work window and Ruby were unable to obtain a waiver of the timing extension from the jurisdictional resource agency, and physical conditions were appropriate. A successful HDD would result in less impact on water resources along the path of the HDD. No sedimentation would be created by the crossing, and stream bank and stream bottom restoration would not be needed as disturbance to these areas would be avoided by the HDD. However, the likelihood of HDD failure increases in areas of glacial till or outwash interspersed with boulders and cobbles, fractured bedrock, or non-cohesive coarse sands and gravels.

Temporary extra workspace is generally required at waterbody crossing to store excavated trench material from the waterbody. Ruby's Procedures state that all extra workspaces could generally be located at least 50 feet from waterbody edges, but site-specific conditions may require extra workspaces in or within waterbodies. Ruby submitted site-specific construction plans and an extra workspace table (see table E-1 in Appendix E) that identifies extra workspaces and staging areas in and within 50 feet of waterbodies. We have reviewed the plans and extra workspace table and have determined that Ruby has not provided sufficient site-specific justification to allow us at this time to approve Ruby's use of extra workspaces and staging areas in or within 50 feet of waterbodies. Therefore, **we recommend that Ruby locate all temporary extra workspaces and staging areas at least 50 feet from waterbodies and limit the construction right-of-way to 115 feet wide in waterbodies.** Prior to construction, Ruby would include these measures in its final construction alignment sheets filed for review and written approval by the Director of OEP. We would reconsider Ruby's waterbody crossing plans prior to issuing a Notice to Proceed if Ruby provides reasonable site-specific justification for each extra workspace and staging area within 50 feet of a waterbody and each instance where the construction right-of-way width would exceed 115 feet in a waterbody.

Seasonal and flash flooding hazards are a potential concern where the pipeline would cross or is near major streams, lakes, and small watersheds. Although flooding itself does not present a risk to pipeline facilities, bank erosion and/or scour could expose the pipe or cause sections of pipe to become unsupported. The FWS indicated it has had preliminary discussions with Ruby regarding stream scour. Additionally, Ruby has committed to discussing natural stream restoration techniques with the FWS and state resource agencies. All proposed pipeline facilities would be designed and constructed in accordance with 49 CFR 192, at a minimum. These specifications ensure that pipeline facilities are designed and constructed in a manner to provide adequate protection from washouts and floods, and include specifications for installing the pipeline at a sufficient depth to avoid possible scour at waterbody crossings. Ruby would monitor all streams disturbed by construction for at least 5 years after construction, and would conduct aerial and pedestrian surveys of the pipeline right-of-way throughout the

life of the pipeline to identify issues such as streambed scouring or potential pipe exposure. The FERC and the BLM (on BLM-managed lands) would also monitor restoration and revegetation success and would ultimately determine if restoration is successful. Should bank erosion or stream scour issues be identified, Ruby would be required to remediate the problems.

Some landowners along the proposed pipeline route have expressed concern that construction of the pipeline would change drainage and flow patterns on their properties. Ruby's Procedures detail measures that would be implemented to mitigate for potential impacts resulting from dewatering, excavation, excessive soil compaction, and removal of vegetation within construction areas. Ruby's Procedures also require that the construction area be restored to preconstruction conditions. Although drainage patterns could change during construction, these impacts would be localized and temporary. Further, Ruby's Plan details measures it would implement to mitigate for changes in drainage patterns. These measures include restoration, monitoring, and correction of drainage and irrigation system problems that could result from pipeline construction in active agricultural areas.

Comments were received about the potential to increase stream water temperatures during operation of the pipeline. Compression is required to move natural gas along a pipeline system. Compressor stations, usually placed at 40 to 100 mile intervals along the pipeline, compress the natural gas by either a turbine, motor, or engine. For this project, three of Ruby's compressor stations would use turbine units and one compressor station would use electric drive engines (see section 2.1.2). The use of these units generates heat and warms the natural gas as it is compressed. At the Roberson Compressor Station, Ruby proposes to install discharge coolers to reduce the temperature of the natural gas as it leaves the station. The remaining compressor stations would operate at a reduced compression capacity, thus minimizing the amount of heat generated during compression. Ruby is also internally coating the pipeline to reduce the amount of compression needed to operate the pipeline. Further, the temperature of the natural gas and the pipeline drop with the distance from the compressor station. The pipeline would be installed a minimum of 5 feet below stream bottoms. Alliance Pipeline Limited Partnership conducted studies to monitor the heat effects of pipelines on soil temperature. Although these studies relate to plant growth in terrestrial environments, preliminary results indicate that temperature transfer from the pipeline does not appear to affect plant growth (Alliance, 2009). We are not aware of similar studies for an aquatic ecosystem; however, we expect that the amount of heat transfer through the ground at a distance of 5 feet would be minimal and would not markedly increase flowing water temperatures.

In addition to the construction and conservation measures described above, Ruby would need to obtain a COE Section 404 permit and Section 401 state water quality certifications and comply with all conditions within these authorizations.

4.3.2.5 Hydrostatic Testing and Dust Control

Ruby would verify the integrity of its pipeline before placing it into service by conducting a series of hydrostatic tests. Ruby also would implement dust control procedures when a visible plume of dust extends more than 300 feet from the source with an estimated opacity exceeding 20 percent. Ruby would use both groundwater and surface water sources for hydrostatic testing and dust control. The surface water sources Ruby proposes to use for hydrostatic test water and dust abatement are presented in table 4.3.2-6. Groundwater sources and impacts associated with hydrostatic testing and dust control are discussed in section 4.3.1.6.

Ruby's Hydrostatic Test Plan (Appendix K) and Draft Fugitive Dust Control Plan (Appendix O) state that 51,506,417 gallons of surface water would be required for hydrostatic testing of the pipeline. Of this, 22,517,633 gallons would be obtained from the Bear River. Subsequently, Ruby indicated in its September 10, 2009 filing that the Bear River would not be used as a water source for hydrostatic testing

and dust control and that Ruby is seeking alternate water sources from the Bear River Canal Company for the 22,517,633 gallons of water that originally were to be used from the Bear River. For the purposes of our review, we are evaluating the use of 28,988,784 gallons of surface water as indicated in table 4.3.2-6 (*i.e.*, not withdrawn from the Bear River). Ruby has estimated that about 152,040,000 gallons of water would be required for dust abatement. Of this total, 35,280,000 gallons would be obtained from surface water sources.

TABLE 4.3.2-6

Surface Water Sources for Hydrostatic Testing and Dust Control for the Ruby Pipeline Project

State	MP	Surface Water Source	Hydrostatic Test Water Volume (gallons)	Dust Abatement and Alternate Hydrostatic Test Water Volume (gallons)	Total Volume to be Appropriated (gallons)
Wyoming	0.4	Roberson Creek	-	1,680,000	1,680,000
	0.8	Hams Fork River	14,452,371	1,680,000	16,132,371
	1.3	South Side Ditch	-	1,680,000	1,680,000
	19.8	Little Muddy Creek	-	1,680,000	1,680,000
	20.4	Little Muddy Creek	-	1,680,000	1,680,000
	23.9	Little Muddy Creek	-	1,680,000	1,680,000
	27.1	Ryckman Creek	-	1,680,000	1,680,000
Utah	43.3	Hopkins #2 Pond	-	1,680,000	1,680,000
	60.7	Woodruff Creek	5,477,349	1,680,000	7,157,349
	90.9	Little Bear River East Fork	-	1,680,000	1,680,000
	92.0	Porcupine Canal	9,059,064		9,059,064
	94.7	Bear River South Fork	-	1,680,000	1,680,000
	94.8	Bear River South Fork	-	1,680,000	1,680,000
	117.7	Corrine Canal	-	1,680,000	1,680,000
	118.2	Central Canal	-	1,680,000	1,680,000
	119.5	Sulphur Creek	-	1,680,000	1,680,000
	127.3	West Canal	-	1,680,000	1,680,000
	132.3	West Canal Faust Road	-	1,680,000	1,680,000
	149.3	Holmgren Pond	-	3,360,000	3,360,000
Oregon	632.5	Dry Creek	-	1,680,000	1,680,000
	R662.0	Willow Valley Reservoir	-	1,680,000	1,680,000
		Total	**28,988,784**	**35,280,000**	**64,268,784**

The withdrawal of large volumes of water from the surface water sources could temporarily affect the recreational and biological uses of the resource if the diversions constitute a large percentage of the source's total flow or volume. Water withdrawals could also result in temporary loss of habitat, change in water temperature and dissolved oxygen levels, and entrainment or impingement of fish or other aquatic organisms. Section 4.6 further discusses potential impacts on aquatic resources due to water withdrawals.

Eight of Ruby's proposed water sources (Hams Fork River, South Side Ditch, Little Muddy Creek, Ryckman Creek, Woodruff Creek, Little Bear River East Fork, Bear River South Fork, and Dry Creek) are known to contain special status species. In addition, the FWS stated that water withdrawals

(depletions) from the Hams Fork River, which is located within the Colorado River system, may affect the bonytail chub, Colorado pikeminnow, razorback sucker, and humpback chub. Impacts on these and other federally listed species, including potential depletion impacts, are discussed in section 4.7.

Ruby would minimize the potential effects of water withdrawals from surface waters by adhering to measures in its Hydrostatic Test Plan (Appendix K). As stated in the Hydrostatic Test Plan, Ruby would screen intake hoses to prevent the entrainment of fish and other aquatic organisms. Ruby would acquire the necessary permits and approvals from state and federal agencies and obtain or comply with water rights before appropriating surface waters.

Ruby has proposed to appropriate water for hydrostatic testing between the months of August and March. Ruby stated that it would regulate the rate of withdrawal of test water to avoid adverse impacts on aquatic resources or downstream flows. Ruby's Hydrostatic Test Plan states these rates would not exceed 2,500 gallons per minute and would not exceed 10 percent of the waterbody's base flow rate at the time of water withdrawals. We have reviewed the most current, available historic stream flow data for Hams Fork River and Woodruff Creek where the majority of surface water would be appropriated. No historic stream flow data is available for Porcupine Canal. Table 4.3.2-7 identifies average historic stream flows and the amount of time required to appropriate the necessary test water while maintaining 10 percent of the historic base flow of the waterbodies. Based on available data, sufficient stream flows would likely be available for the Hams Fork River and Woodruff Creek. Additionally, Ruby has stated that its water withdrawals from the Hams Fork River would coincide with water releases from PacifiCorp's upstream reservoir to maintain base streamflow in the river. For the remaining surface waters identified in table 4.3.2-6 that would be used for dust control, we do not believe the small volumes of water required from each source and the duration over which the water would be appropriated (small incremental volumes over the duration of construction to control dust) would affect aquatic or sensitive resources or downstream water rights. As previously stated, Ruby would not appropriate waters from any source unless it receives approval from the state water engineer's office and water rights holders.

TABLE 4.3.2-7

Historic Flow Data and Time Required to Appropriate Water for the Ruby Pipeline Project

Water Source	Total Volume to be Appropriated (gallons)	USGS Gauging Station/Estimated Distance from Crossing (river miles)	Historic Average Monthly Streamflow Between August and December (gpm)	Historic Average Monthly Streamflow Between January and March(gpm)	Time Required to Appropriate Required Volume While Maintaining 10 Percent Historic Flows (days)
Hams Fork River	16,132,371	09223000 / 37	8,527.2[a]	7,630.1[a]	13.1-14.7
Woodruff Creek	7,157,349	10020900 / 2.5	3,133.5[b]	1,265.7[b]	15.9-39.3

a USGS, 2009. Data compiled from 1985 to 2008.

b USGS, 2009. Data compiled from 1970 to 1986.

Ruby would test the pipeline in about 90 to 100 test sections. The number of test sections would be necessitated by elevation changes and availability of water sources across the project area. Therefore, Ruby would discharge test water at numerous locations along the pipeline route (see Appendix K).

All surface water used for hydrostatic testing would be discharged within the same 8-digit HUC watershed from which it was withdrawn. This would prevent the inadvertent transfer of pathogens or NAS between 8-digit HUC watersheds. No chemicals would be used during testing of the pipe; however,

Ruby would use industry-accepted and agency-approved biocides to appropriately treat test water for pathogens and NAS when source waters have the potential to or have been identified as having pathogens or NAS, and the discharge of those source waters have the potential to reach other surface waters that do not contain pathogens or NAS. Ruby conducted a database search and consulted with state resource agencies to identify surface water sources that may contain pathogens and/or NAS (Appendix K). The Hams Fork River, Woodruff Creek, and Porcupine Canal have the potential to contain NAS. Surface water sources to be used for dust control may contain pathogens or NAS; however, we do not believe there is a potential to transfer pathogens or NAS between surface waters during dust control as these practices would typically be conducted in dry upland locations. As stated in the Hydrostatic Test Plan, Ruby would implement various procedures to ensure pathogens or NAS are not spread between waterbodies, such as:

- discharge of surface waters within the same 8-digit HUC watershed in which it was appropriated;
- screen intakes with 0.25-inch screens or screens necessary to comply with Oregon fish screen requirements to prevent NAS fish entrainment; and
- discharge of surface waters to upland areas and treat discharges that may contain NAS with biocides as discussed below.

Ruby has identified a number of biocides and chemicals that could be used to neutralize pathogens and NAS, which include GreenClean Pro, CO_2, Formula 409, bleach, copper sulfate, quaternary ammonium salts, potassium permanganate, hydrogen peroxide, and tetrakis hydroxymethyl phosphonium sulfate. Ruby has identified pros and cons for each biocide in Appendix K. Should treatment be necessary, Ruby would conduct a bench test to determine dose and contact time for the chosen biocide in relation to the pathogen and/or NAS that is being treated. Additionally, should biocide treatment be required, an appropriate biocide would be selected in consultation with agency partners.

The WGFD and NDOW recommend the use of temporary sediment basins where water discharge points are less than 0.5 mile from a perennial stream, and when the discharge point is more than 0.5 mile from a stream and the discharge flow is greater than 0.5 cubic feet per second (cfs). Ruby has committed to discharging to temporary sediment basins when the discharge point is less than 0.5 mile from a stream and the discharge flow is greater than 0.5 cfs. However, due to the sparse vegetation and high erodibility throughout the project area, **we recommend that Ruby discharge all hydrostatic test water to a temporary sediment filtration and energy dissipation structure.**

UTPL has requested that hydrostatic test water discharges in Utah do not come within 50 feet of the high-water line of receiving waters. Ruby would be required to comply with NPDES waste water discharge permit requirements under Section 402 of the CWA, which include provisions for sampling and monitoring hydrostatic test water discharges. Additionally, we have recommended that Ruby discharge all hydrostatic test water to temporary sediment structures. We believe these measures would sufficiently protect water resources in the State of Utah.

No long-term, significant impacts on surface waters are anticipated as a result of the project because designated water uses would not be permanently affected, the pipeline would be installed beneath the bed of waterbodies, erosion controls would be implemented, and the streambanks and streambed contours would be restored as close as practical to preconstruction conditions. We believe the techniques proposed by Ruby and our recommendations adequately address potential impacts on surface waters.

4.3.3 Wetlands

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support a prevalence of wetland vegetation typically adapted for life in saturated soil conditions (Environmental Laboratory, 1987). Wetlands can be a source of substantial biodiversity and can serve a variety of functions. These functions include: providing wildlife and aquatic habitat, recreational opportunities, naturally improving water quality, and providing flood control.

Sections 401 and 404 of the CWA of 1972 were created specifically with the intent "to restore and maintain the chemical, physical, and biological integrity of our Nation's waters." The COE has authority under section 404 of the CWA to review and issue permits for activities that would result in the discharge of dredged or fill material into wetlands. Section 401 of the CWA requires that proposed dredge and fill activities under section 404 be reviewed by designated state agencies. The designated state agencies also must certify that the proposed action would meet state water quality standards.

Executive Order 11990, amended in 42 USC 4321 *et. seq*., requires federal agencies "to avoid adverse impacts associated with the destruction or modification of wetlands wherever there is a practicable alternative" and to "include all practicable measures to minimize harm to wetlands" on federally managed land. Further, the agencies are required to preserve and enhance the natural and beneficial values of wetlands.

The COE *Wetlands Delineation Manual* (Environmental Laboratory, 1987) provides the standards for determining areas of wetlands and deepwater habitats. Land areas are defined as wetlands when soil, hydrology, and vegetation all meet the technical criteria for establishing wetlands. Wetland delineations for the Ruby project were conducted in 2008 and 2009 in accordance with these federal regulations and methodologies, including the Arid West Region supplement to the 1987 COE Manual.

Palustrine emergent (herbaceous) wetlands are the most common type of wetland community crossed by the pipeline route, followed by unconsolidated bottom and shore wetlands. Other wetland communities crossed include scrub-shrub wetlands, lacustrine aquatic bed or unconsolidated shore wetlands, and forested wetlands. Table 4.3.3-1 summarizes the type and amount of wetland that would be impacted by the proposed pipeline route, extra workspaces, yards, and access roads. A complete list of wetlands crossed by the project is provided in Appendix R. No wetlands were identified at aboveground facility sites, the Vya Construction Camp site, or the Lakeview Temporary Housing Facility site.

4.3.3.1 Potential Wetland Impacts

As shown in Appendix R, the proposed pipeline route, including extra workspace, would cross 148 wetland areas for a total of 376 acres. The use of contractor yards, staging areas, and access roads may also temporarily affect about 59 acres of wetland. About 79 percent of the wetlands affected by the project is palustrine emergent (*i.e.*, herbaceous) wetland. The remaining wetland types include unconsolidated shore wetland (21.3 percent) and scrub-shrub wetland (0.6 percent). No forested wetlands would be crossed or otherwise affected by the project.

TABLE 4.3.3-1

Summary Of Wetlands Crossed by the Ruby Pipeline Project

State	Cowardin Classification	Wetland Acreage within the 75' Construction Workspace	Wetland Acreage within the 50' Operational Right-of-Way	Wetland Acres within the Extra Workspace	Wetland Acres within Construction Yards and Staging Areas	Wetland Acres within the Access Road 30' Improvement
WYOMING						
	PEM	3.0	2.0	0.8	0.1	0.3
WYOMING						
	PEM / PSS	1.9	1.2	-	-	-
	PSS	0.1	0.1	-	-	-
	PEMF	0.1	0.1	-	-	-
	Unknown	-	-	-	3.7	0.5
	Subtotal	5.1	3.3	0.8	3.8	0.9
UTAH						
	PEM	14.3	9.7	16.8	36.0	6.1
	PEM / L2USA	1.5	1.0	2.4	-	-
	PEMA	0.1	0.1	0.2	-	-
	PEMC	0.3	0.2	0.3	-	-
	PEM / L2USA / PUSA	27.5	18.4	43.9	-	0.2
	PSS	1.3	0.9	0.7	-	2.3
	PUSC	1.0	0.7	-	-	-
	L2USA	3.0	2.0	-		-
	PUSCx	0.3	0.2	1.4	-	-
	Unknown	0.0	0.0	0.1	-	1.0
	Subtotal	49.3	33.2	65.8	36.0	9.6
NEVADA						
	PEM	19.1	12.7	0.4	0.9	2.3
	PSS	0.1	0.1	-	-	-
	Subtotal	19.2	12.8	0.4	0.9	2.3
OREGON						
	PEM	93.6	62.3	142.0	3.0	2.6
	PSS	0.2	0.1	-	-	0.0
	Subtotal	93.7	62.4	142.0	3.0	2.6
	Total	167.3	111.8	208.9	43.7	15.3

TABLE 4.3.3-1

Summary Of Wetlands Crossed by the Ruby Pipeline Project

State	Cowardin Classification	Wetland Acreage within the 75' Construction Workspace	Wetland Acreage within the 50' Operational Right-of-Way	Wetland Acres within the Extra Workspace	Wetland Acres within Construction Yards and Staging Areas	Wetland Acres within the Access Road 30' Improvement
PEM	Palustrine Emergent Wetland					
PEMA	Palustrine Emergent, Temporarily Flooded					
PEMC	Palustrine Emergent, Seasonally Flooded					
PEMF	Palustrine Emergent, Semi-permanently Flooded					
PSS	Palustrine Scrub-Shrub Wetland					
PUSC	Palustrine Unconsolidated Shore, Seasonally Flooded					
PUSCx	Palustrine Unconsolidated Shore, Seasonally Flooded Excavated					
L2USA	Lacustrine Littoral Unconsolidated Shore, Temporarily Flooded					
PUSA	Palustrine Unconsolidated Shore, Temporarily Flooded					

The construction of a pipeline could have several impacts on a wetland system. Removal of vegetation could result in alteration of various wetland functions including loss of fish and wildlife habitats, sediment and nutrient trapping, and other water quality functions. Soil disturbance and removal of vegetation could temporarily affect a wetland's capacity to moderate flood flow, control sediment, or facilitate surface water flow. Removal of vegetation could increase water and soil temperatures and alter species composition within forested and shrub wetlands to a more shade-intolerant composition. Digging a trench through an impervious layer of soil in a wetland could alter the hydrology of a perched water table and affect the reestablishment of wetland functions. Failure to segregate topsoil from the trench could result in altered biological and chemical functions in the wetland soil and could affect vegetation reestablishment, recruitment of native vegetation, or success of future plantings. Improper operation of equipment in wetlands could inadvertently rut or compact the soil and affect natural hydrologic patterns, which may lead to inhibited seed germination or increase the potential for siltation. Improper sediment controls could lead to sediment deposition in the wetlands, which could lead to the release of chemical and nutrient pollutants from sediments. The primary effects of the proposed pipeline construction and operation activities on wetlands would be the short- and long-term alteration of wetland vegetation.

In herbaceous wetlands (palustrine, emergent, and riverine), the effects of pipeline construction would be considered temporary because the topsoil would be preserved, the hydrology would not be altered, and herbaceous vegetation would transition back to a community with functionality similar to that of the wetland prior to construction (typically within 1 to 3 years). Ruby would work to reestablish preexisting wetland elevations, restore surface hydrology, and allow herbaceous vegetation to return to preconstruction conditions after construction.

Scrub-shrub wetlands could take considerably longer to recover and reach functionality similar to preconstruction conditions. Construction activities would temporarily displace wildlife from the pipeline right-of-way and reduce the recreation and aesthetic functions of wetlands. Indirect effects to wetlands outside the construction right-of-way are expected to be negligible because Ruby would implement measures during construction to avoid changes to wetland hydrology and to contain sediment within the construction right-of-way. Additional measures to mitigate for any permanent effects to scrub-shrub wetlands would be determined during Ruby's COE permitting process and may require compensatory mitigation as discussed in section 4.3.3.3.

Ruby's Procedures allow maintenance clearing to be conducted along a corridor centered on the pipeline to facilitate periodic pipeline and corrosion/leak surveys. A vegetation strip up to 10 feet wide may be maintained in an herbaceous state. In addition, trees within 15 feet of the pipeline greater than 15 feet in height may be selectively cut and removed from the permanent right-of-way. By maintaining scrub-shrub vegetation in an herbaceous type, some of the functions (primarily wildlife habitat) of scrub-shrub wetlands would be permanently altered. This would not result in a net loss of wetland, but rather a conversion from scrub-shrub vegetation to a more herbaceous vegetation type. Based on Ruby's field survey data, about 1.5 acres of scrub-shrub wetland would be converted to herbaceous wetland.

Ruby's Procedures state that the only access roads, other than the construction right-of-way, that would be used in wetlands without additional FERC approval are existing roads that can be used with no modification and no impact on the wetland. However, Ruby has identified 98 wetland areas that occur within the 30-foot-wide access road improvement workspace (see Appendix R). Ruby is seeking approval to improve access roads in all these wetland areas. To facilitate our review of Ruby's request, **we recommend that Ruby file site-specific justification that identifies where access road improvements in wetlands are proposed to occur. Ruby should include an explanation as to why each wetland cannot be avoided and a description of the construction and restoration measures that would be implemented to minimize wetland impacts. Ruby should not begin access road improvements in wetlands until it has received written authorization from the Director of OEP.** It should be noted that it is impossible to determine precisely where access roads improvements would be required, and access road improvements may not be required in all the wetland areas identified in Appendix R. Where access road improvements occur within wetlands, temporary impacts such as loss of vegetation, compaction, and altered wetland hydrology may occur. Ruby would install temporary culverts to minimize hydrology impacts. Ruby has stated it would restore all lands impacted by access road improvements to its original condition unless otherwise approved by land-managing agencies and/or authorized by wetland regulatory agencies. Ruby would also monitor restoration of disturbed wetland areas as discussed below. No permanent wetland impacts are anticipated by access road improvements. Dredge and fill activities in COE jurisdictional wetlands, which include access road improvement activities, would require additional authorization from the COE.

4.3.3.2 Wetland Construction and Mitigation Procedures

Ruby's Procedures (Appendix F) contain wetland mitigation measures that are designed to minimize the overall area and duration of wetland disturbance, reduce the amount of wetland soil disturbance, and enhance wetland restoration following construction. Ruby's Procedures include the following wetland mitigation and restoration measures:

- limit the operation of construction equipment within wetlands to equipment essential for clearing, excavation, pipe installation, backfilling, and restoration;
- limit grading to directly over the trench line, except where necessary to ensure safety;
- limit grading by using low ground weight construction equipment, or by operating equipment from prefabricated timber mats in saturated or standing-water wetlands;
- segregate topsoil from the trench line in non-saturated wetlands;
- minimize the time the trench is open in wetlands;
- use the push-pull crossing method in wetlands, where possible;
- install trench breakers at the boundaries of wetlands as needed to prevent draining of a wetland and to maintain original wetland hydrology;
- prohibit storage of hazardous materials, chemicals, fuels, and lubricating oils within 100 feet of a wetland boundary (150 feet in Oregon) unless infeasible;

- prohibit the refueling of equipment within 100 feet of wetlands, and 500 feet of wetlands on BLM-administered lands, unless the EI finds no reasonable alternative;
- restrict annual maintenance of vegetation to a 10-foot-wide strip centered over the pipeline to trees greater than 15 feet in height within 15 feet of the pipeline centerline;
- consult with the appropriate land managing or state agencies to develop plans to revegetate wetlands, and, where necessary, preventing the invasion or spread of undesirable exotic and invasive vegetation; and
- monitor the success of wetland revegetation annually for a period of at least 3 years after construction, or until the wetland is successfully revegetated.

Ruby would restore wetlands to preconstruction contours and elevations and would leave existing root systems intact where possible to encourage regrowth and revegetation along the equipment passage and soil storage areas. Ruby would salvage topsoil in areas to be excavated, unless saturated soil conditions are present. The replaced topsoil would be a source of native seeds and propagules. Ruby would implement a program to control and prevent the spread of noxious and invasive weeds along the construction right-of-way (see section 4.4.6).

In general, the width of the construction right-of-way in wetlands would be limited to 75 feet; however, Ruby has identified 53 wetland crossings where it believes the 75-foot wide construction right-of-way should be expanded to accommodate topographic conditions, soil storage, crossing of waterbodies, and other construction and safety issues. About 51.0 acres of wetland would be impacted by expanding the pipeline right-of-way in wetlands. In addition, Ruby has identified 54 areas (totaling about 2.7 acres) where the temporary extra workspaces would be located less than 50 feet from wetlands. Ruby's Procedures state extra workspaces would generally be located at least 50 feet away from wetland boundaries. Ruby submitted site-specific plans for a portion of the areas where the construction right-of-way should be expanded and where extra workspaces are located in wetlands and within 50 feet of wetlands. Ruby has also submitted a table identifying the location and acreage of wetlands impacted by expanding the construction right-of-way and the use of extra workspaces in and within 50 feet of wetlands (Appendix E). However, we have reviewed these plans and the extra workspace table and determined that Ruby has <u>not provided sufficient site-specific justification</u> to support its requests. Therefore, **we recommend that Ruby locate all temporary extra workspaces and staging areas at least 50 feet from wetlands and limit the construction right-of-way to 75 feet wide in wetlands.** Prior to construction, Ruby would include these measures in its final construction alignment sheets filed for review and written approval by the Director of OEP. We would reconsider Ruby's wetland crossing plans if Ruby provides case-by-case, site-specific justification for: 1) each extra workspace and staging area within 50 feet of a wetland, and 2) each instance where the construction right-of-way would exceed 75 feet wide in a wetland.

Ruby would generally locate the pipeline 50 feet from existing utilities. Our Procedures require that new pipelines be located no more than 25 feet away from existing pipelines in wetlands unless site-specific constraints would adversely affect the stability of the existing pipelines. Ruby indicated that a 50-foot separation is necessary because existing pipelines and utilities may deviate up to 3 feet from their generally accepted centerlines. Ruby also stated that a minimum 50-foot separation would be required at tie-in locations to existing pipelines to maintain the stability of the existing pipelines as well as to meet OSHA ditch safety standards. The offset would also facilitate future maintenance inspections of the pipeline where excavation would require safe ditches and could affect the integrity of the adjacent pipelines. We believe Ruby's proposed 50-foot separation from existing utilities in wetlands is reasonable.

4.3.3.3 Wetland Restoration

Ruby's Procedures include the commitment to successfully restore wetland vegetation. Revegetation would be considered successful if the cover of herbaceous and/or woody vegetation is at least 80 percent of the type, density, and distribution of vegetation in adjacent undisturbed wetland areas. Ruby stated it would monitor the success of wetland revegetation annually for the first 5 years after construction or until revegetation is successful. After 5 years of annual monitoring, Ruby would file a report identifying the status of wetland revegetation efforts, and would continue filing an annual report until wetland revegetation is successful. If revegetation is not successful at the end of 5 years, Ruby would develop and implement (in consultation with a professional wetland ecologist) a remedial plan to actively revegetate wetland areas until revegetation is successful. Ruby stated it would employ maintenance measures to ensure successful wetland restoration, including irrigation system repair, plant replacement, non-native plant control, water structure repair, fertilization, erosion control, wildlife protection, trash removal, and/or any other related activities. Dead plants would be replaced during the growing season in which they are identified and/or immediately in the beginning of the next growing season (*i.e.*, replacement would occur at the earliest feasible period based on seasonal limitations). All plant material would be replaced in-kind with native material; consisting of potted, nursery stock and/or native cuttings collected from local sources.

Ruby's Procedures also state that it would develop a project-specific wetland restoration plan to restore affected wetland areas. The plan would outline site preparation techniques, grading plans, methods to sustain hydrology, planting and seeding plans, and schedules. Although Ruby has not finalized its specific wetland restoration plan, Ruby has identified several restoration techniques that may be used to restore wetland vegetation, which include:

- wetland sod harvesting and transplanting;
- harvesting and transplanting herbaceous plugs, shrubs, and trees;
- live cutting collection, storage and planting;
- wetland soil harvesting and transplanting;
- planting of commercially grown herbaceous plugs, shrubs, and trees;
- planting of commercially grown wetland sod;
- temporary or permanent/above or below ground irrigation systems;
- erosion control blankets (weed free);
- soil enrichment (decompaction and organic/nutrient amendment);
- temporary seeding (sterile or native seed for site protection or nitrogen fixing);
- permanent seeding (regional native seed or site specific harvesting);
- straw mulching (not weed free);
- hydro mulching (weed free);
- cattle removal and recovery systems (fencing and control water access); and
- invasive plant and weed management systems, including:
    - mechanical (mowing, tilling);
    - chemical (water safe herbicides);
    - biological (integrated pests); and
    - cultural (grazing and burning).

Ruby's Procedures state that this plan would be developed in consultation with appropriate land management or state agencies and would be provided to FERC (upon request). Because wetlands are a limited and unique feature in the arid west and are crucial to numerous wildlife and aquatic species, **we recommend that, prior to construction, Ruby file its Wetland Restoration Plan. This plan should be developed in consultation with the COE and appropriate state and land managing agencies.**

This plan should include measures for seeding and replanting wetland vegetation affected by all project activities and should identify measures for ensuring wetland revegetation would be successful.

Ruby may be required to compensate for permanent wetland impacts through various forms of compensatory mitigation with the COE and other appropriate state agencies. Ruby is considering the option of wetland mitigation banking as a form of compensatory mitigation for wetland impacts. Mitigation banks are a form of "third-party" compensatory mitigation in which the responsibility for compensatory mitigation implementation and success is assumed by a party other than the permittee (EPA, 2009a). Mitigation banking is an approved alternative to onsite mitigation and often provides for greater likelihood of success in replacement of wetland function and long-term management of restored wetland areas. A preliminary review of available and appropriate mitigation banking credits suggests sufficient mitigation credits are not available for the project. Ruby has prepared a Preliminary Wetland Mitigation Report (Appendix S) that describes the current status of wetland mitigation consultations and provides project wetland impacts, proposed mitigation ratios for each state, and suggested mitigation recommendations. The exact type and amount of mitigation that would be required for the project cannot be determined until the COE reviews Ruby's application. The COE would complete its own internal review of the project to ensure the project meets the requirement of the CWA.

In addition to the mitigation measures and compensatory mitigation described above, Ruby would be required to comply with the COE's Section 404 permit conditions and state-issued Section 401 water quality certifications or waivers. By implementing construction and restoration measures outlined in Ruby's Plan and Procedures, completing compensatory mitigation as determined by the COE and other appropriate state agencies, complying with federal and state permit conditions, and implementing our recommendations above, we do not believe the project would result in any significant impacts on wetlands.

4.3.4 Non-Jurisdictional Electric Power Lines

The Rocky Mountain Power and Harney Electric Cooperative electric transmission and distribution lines would be located in areas where depth to groundwater exceeds 200 feet and 40 feet, respectively. Boreholes are not expected to exceed 10 feet below the surface ground. Therefore, no impacts on groundwater are expected. Field surveys did not identify any streams or wetlands within the proposed Rocky Mountain Power project area, and only one ephemeral waterbody and no wetlands would be crossed by the Harney Electric Cooperative electric distribution line. The ephemeral waterbody is narrow enough that it could be spanned with normal spacing of the power line poles. Therefore, there would be no direct impacts on the waterbody. Indirect impacts, however, could occur as a result of vegetation clearing and surface grading to access and construct the line. Stormwater runoff could result in increased turbidity and localized sedimentation of the stream. Harney Electric Cooperative would install erosion control devices during construction to prevent or minimize sediment runoff. These impacts, therefore, would be expected to be temporary and minor.

4.4 VEGETATION

The project would cross five ecoregions: the Wyoming Basin, the Wasatch and Uinta Mountain Basin, the Central Basin and Range, the Northern Basin and Range, and the Cascades Slopes and Foothills Basin (Bailey, 1995; EPA, 2009g). Ecoregion land classifications provide information for research, assessment, monitoring, and management of ecosystems and ecosystem components. Federal and state agencies and nongovernmental organizations responsible for different types of resources use this

information to estimate ecosystem productivity, determine probable responses to land management practices and other ecosystem disturbances, and to address environmental issues over large areas, such as air pollution, forest disease, or threats to biodiversity.

The Wyoming Basin ecoregion is a broad intermontane basin dominated by arid grasslands and shrublands and interrupted by high hills and low mountains. The region is somewhat drier than the Northwestern Great Plains to the northeast. The Wyoming Basin is nearly surrounded by forest-covered mountains but does not have the extensive cover of pinyon-juniper woodland found in the Colorado Plateaus to the south. Much of the ecoregion is used for livestock grazing, although many areas lack sufficient vegetation to support this activity. This ecoregion contains major producing natural gas and petroleum fields.

The Wasatch and Uinta Mountain Basin ecoregion is composed of a core area of high, precipitous mountains with narrow crests and valleys flanked in some areas by dissected plateaus and open high mountains. The elevational banding pattern of vegetation is similar to that of the Southern Rockies except that aspen, chaparral, and juniper-pinyon and oak are more common at middle elevations. This characteristic, along with a far lesser extent of lodgepole pine and greater use of the region for grazing livestock in the summer months, distinguishes the Wasatch and Uinta Mountain Basin ecoregion from the more northerly Middle Rockies.

The Central Basin and Range ecoregion is internally drained and is characterized by a mosaic of xeric basins, scattered low and high mountains, and salt flats. It has a hotter and drier climate, more shrubland, and more mountain ranges than the Snake River Plain and Northern Basin and Range ecoregions to the north. Basins in this ecoregion are covered by basin big sagebrush or saltbush-greasewood vegetation that grows well in Aridisol soils. Cool-season grasses are less common in this ecoregion than in the Mollisol soils of the Snake River Plain and Northern Basin and Range. The ecoregion is not as hot as the Mojave and Sonoran Basin and Range ecoregions, and a greater percent of land is grazed.

The Northern Basin and Range ecoregion contains arid intermontane basins, dissected lava plains, and scattered mountains. Shrub communities and aridisol soils are common, and non-mountain areas have sagebrush steppe vegetation. Ranges are generally covered in sagebrush at higher elevations. Overall, the ecoregion is drier and less suitable for agriculture than the Columbia Plateau and is higher and cooler than the Snake River Plain. Rangeland is common and irrigated agriculture occurs in the ecoregion's basins.

The Eastern Cascade Slopes and Foothills ecoregion is in the rainshadow of the Cascade Mountains. Its climate exhibits greater temperature extremes and less precipitation than ecoregions to the west. Open forests of ponderosa pine and some lodgepole pine distinguish this ecoregion from the higher ecoregions to the west where fir and hemlock forests are common, and the lower, dryer ecoregions to the east where shrubs and grasslands are predominant. Vegetation in this ecoregion is adapted to the prevailing dry continental climate and is highly susceptible to wildfire. Volcanic cones and buttes are common in much of the region.

4.4.1 Vegetation Resources

The Ruby Pipeline Project would cross nine upland vegetation cover types: sagebrush steppe, salt desert scrub, juniper woodland, mixed conifer forest, North Pacific wooded volcanic flowage, riparian forest, grasslands, mountain meadow/brush, and agricultural land and pasture. Descriptions of each vegetation cover type are presented in table 4.4.1-1. Wetland vegetation crossed by the project is discussed in section 4.3.3. Non-vegetated areas are discussed in section 4.8.1.4.

TABLE 4.4.1-1

Upland Vegetation Communities Occurring Along the Ruby Pipeline Project

Vegetation Community Type	General Description and Notes	Representative Plant Species
Sagebrush Steppe	Largely treeless. Mosaic of grasses and shrubs. Most undisturbed area has very little bare ground and contains a larger proportion of perennial grasses than shrubs. Particularly vulnerable to disturbance, especially that caused by grazing. Cheatgrass usually replaces native perennial grasses in disturbed sagebrush habitats.	Wyoming big sagebrush, basin big sagebrush, Lahontan sagebrush, low sagebrush, mountain big sagebrush, bitterbrush, and rabbitbrush.
Salt Desert Scrub	Vegetation composition and density varies considerably along the varying gradients of moisture, salinity, and microtopography. Generally occurs at lower to middle elevations and at many locations intergrades with a number of other arid and semiarid wildlife habitats such as desert grasslands and sagebrush steppe.	Four-wing saltbush, shadescale mat-atriplex, greasewood, sagebrush, blackbrush, galleta, Indian ricegrass, three-awn, and sand dropseed.
Juniper Woodland	Juniper woodlands generally occur at middle elevations, forming a transition between habitats at higher and lower elevations. These habitats can occur on all exposures and slopes but are common on level to gently rolling topography. Junipers can be found on soils ranging from rocky and well drained to drier and poorly drained.	Dense stands of juniper (Juniperus spp.) occur in Elko County and at the Nevada-Utah state border. Other species include antelope bitterbush, buck wheat species, and big sage. Curl-leaf mountain mahogany is associated with open juniper woodlands on dry rocky sites.
Mixed Conifer Forest	Characterized by large, mature tree species with a diverse understory of forbs, grasses, and shrubs. A popular area for wildlife due to the abundant forage.	Aspen, white fir, grand fir, subalpine fir, juniper, bitterbrush, snowberry, sagebrush, chokecherry, serviceberry, mule-ears and heart-leaved arnica.
Northern Pacific Wooded Volcanic Flowage	This ecological system is found from foothill to subalpine elevations and includes woodland to sparsely vegetated landscapes (generally greater than 10 percent plant cover) on recent lava flows, excessively well-drained lahars, debris avalanches and pyroclastic flows.	Open to sparse tree cover with Douglas fir, lodgepole pine, western white pine, and subalpine fir. Scattered to dense shrubs may include vine maple, thinleaf huckleberry, kinnikinnick, cascade barberry, Saskatoon serviceberry, and common beargrass.
Riparian Forest	Varies in type from grasses and grasslike plants to shrubs, deciduous trees, and conifer trees depending on climate, terrain, soils, geomorphology, stream size, and recent flood-disturbance. Associated with river channels, lake shores, hummocks, and wetland edges. Riparian community assemblages vary in composition throughout the project area.	In Wyoming, vegetation generally includes hawthorn, chokecherry, tamarisk, shrubby cinquefoil, timothy grass, reedgrass, and blue wildrye. In Oregon, dominant species include grand fir, white fir, and ponderosa pine with a mix of sedges, rushes, and spikerushes.
Grasslands	Generally used by livestock for grazing. Many of the noxious and invasive plant species that occur in agricultural land also occur in grasslands.	Smooth brome, ricegrass, dropseed, western wheatgrass, and red clover.
Mountain Meadow/Brush	Components of montane zones and generally occur just above mountain foothills. Important areas of biological diversity that attract and sustain a rich variety of wildlife.	Wheat grass, needle-and-thread grass, fescues, various region-specific grasses and wildflowers, big sagebrush, juniper, mahogany, Saskatoon, and chokecherry.
Agricultural Land and Pasture	The majority of crops are irrigated. Agricultural land can harbor populations of noxious and invasive plants. Pastures are used by livestock for forage.	Routinely planted crops include barley, wheat, corn, potatoes, onions, beans, and alfalfa. Pastures include smooth brome, western wheatgrass, barley, oats, and red clover. Invasive species include cheatgrass, musk thistle, dandelion, field bindweed, bull and Canada thistle, sand bur, foxtail barley, puncture vine, and cocklebur.

Ruby has completed a survey and vegetation classification on approximately 96 percent of the project area, including the Vya Construction Camp and Lakeview Temporary Housing Facility sites. Project areas that have not been surveyed include some staging areas, contractor yards, and access roads. We have conducted an aerial photo assessment of the proposed contractor yards and have determined the majority of the yards, which accounts for 78 percent of the unsurveyed project area, are located in industrial parks that have been formally disturbed or developed, or are located in areas that were used as pipeline contractor or pipe storage yards during previous pipeline construction projects.

Our assessment of impacts take into account the entire length of the construction right-of-way for the mainline and lateral pipeline, temporary extra workspaces, aboveground facilities, access roads, the construction and housing camps, and contractor and pipe storage yards. Actual acreage impacted during construction may differ somewhat, as Ruby would reduce its right-of-way width in non-cultivated wetlands and certain other locations and could use or request increased width in other locations for engineering or constructability reasons. Newly identified or revised temporary extra workspaces would affect acreage totals.

4.4.1.1 General Vegetation Impacts

Table 4.4.1-2 identifies acreages of the vegetation types identified through Ruby's field surveys that would be directly affected by construction and operation of the project. Based upon Ruby's survey results to date, construction of the project within surveyed areas would impact about 9,224.8 acres of sagebrush steppe, 2,519.6 acres of salt desert scrub, 346.5 acres of juniper woodland, 577.1 acres of mixed conifer forest, 2.2 acres of North Pacific wooded volcanic flowage, 205.9 acres of riparian forest, 1,055.7 acres of grassland, 788.0 acres of mountain meadow brush, and 1,021.4 acres of pasture and agricultural land.

The primary direct impact from pipeline construction would be the cutting, clearing, and removal of existing vegetation within the construction workspace. The degree of impact would depend on the type and amount of vegetation affected, the rate at which vegetation would regenerate after construction, and the frequency of vegetation maintenance conducted on the right-of-way during pipeline operation. The degree and duration of construction-related impacts varies between vegetation communities as discussed below.

Impacts on agricultural lands, pastures, and grassland communities (2,077.1 acres, or 13.2 percent of vegetation impacted by the project) would be short-term as these vegetation types would return to their herbaceous status within one to three growing seasons after the completion of construction, cleanup, and effectively implemented reclamation. Impacts on these communities during operation of the pipeline would be minimal because these areas would be allowed to recover following construction and would typically not require maintenance mowing. Areas planted with field crops would likely be replanted in the next growing season. The development of noxious weeds in agricultural lands, pasture, and grassland and the spread of weeds or seed from infested areas to adjacent uninfested vegetation communities could occur without proper safeguards. Noxious and invasive weed impacts and mitigation are discussed in detail in section 4.4.6. Agricultural impacts are discussed further in section 4.8.1.3.

TABLE 4.4.1-2

Vegetation Communities Affected by Construction and Operation of the Ruby Pipeline Project (in acres)[a]

Vegetation Component	Sagebrush Steppe		Salt Desert Scrub		Juniper Woodland		Mixed Conifer Forest		Riparian Forest		Grassland		Mountain Meadow/Brush		Pasture and Agriculture		Project Totals	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
WYOMING																		
Right-of-Way	496.7	217.3	93.5	40.9	2.5	0.9	-	-	20.4	9.3	15.0	6.3	5.4	2.3	10.2	5.3	643.7	282.4
Extra Workspaces and Staging Areas	103.3	-	13.0	-	2.0	-	-	-	6.0	-	3.7	-	3.3	-	2.0	-	133.4	0.0
Access Roads	237.1	-	62.0	-	0.9	-	-	-	12.0	-	7.5	-	0.4	-	1.2	-	321.3	0.0
Yards	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0	0.0
Aboveground Facilities	34.1	34.1	5.4	5.4	-	-	-	-	-	-	2.8	2.8	-	-	-	-	42.3	42.3
Subtotal	871.3	251.5	173.9	46.3	5.5	0.9	0.0	0.0	38.4	9.3	29.0	9.1	9.1	2.3	13.4	5.3	1,140.6	324.7
UTAH																		
Right-of-Way	723.4	311.3	625.8	275.6	41.4	18.2	9.8	4.7	42.2	18.4	95.4	40.7	335.0	146.5	323.2	145.5	2,196.0	960.9
Extra Workspaces and Staging Areas	331.5	0.0	178.8	0.0	27.9	0.0	6.7	0.0	25.8	0.0	35.2	0.0	141.0	0.0	258.3	0.0	1,005.4	0.0
Access Roads	282.6	-	182.0	-	11.9	-	0.9	-	14.0	-	31.8	-	116.3	-	114.8	-	754.4	0.0
Yards	5.2	-	1.5	-	-	-	-	-	-	-	2.7	-	0.2	-	74.8	-	84.3	0.0
Aboveground Facilities	-	-	26.6	26.6	-	-	-	-	-	-	-	-	-	-	-	-	26.6	26.6
Subtotal	1,342.7	311.3	1,014.7	302.2	81.2	18.2	17.4	4.7	82.0	18.4	165.1	40.7	592.5	146.5	771.1	145.5	4,066.7	987.5
NEVADA																		
Right-of-Way	3673.7	1404.8	1030.5	394.5	85.0	31.4	1.9	0.6	25.2	9.7	666.5	256.3	50.7	19.4	51.4	20.9	5584.9	2137.6
Extra Workspaces and Staging Areas	1,078.2	-	52.0	-	33.5	-	1.7	-	6.9	-	109.1	-	24.6	-	8.9	-	1,314.8	0.0
Access Roads	1,138.7	-	73.3	-	11.5	-	0.6	-	15.5	-	72.1	-	13.2	-	3.9	-	1,328.8	0.0
Yards	278.4	-	73.2	-	-	-	-	-	-	-	1.0	-	-	-	-	-	352.6	0.0
Aboveground Facilities	26.0	26.0	23.7	23.7	-	-	-	-	-	-	0.1	0.1	-	-	2.5	2.5	52.4	52.4
Subtotal	**6194.9**	**1430.9**	**1252.8**	**418.2**	**130.0**	**31.4**	**4.1**	**0.6**	**47.7**	**9.7**	**848.8**	**256.4**	**88.5**	**19.4**	**66.7**	**23.4**	**8633.6**	**2190.0**
OREGON																		
Right-of-Way	511.2	222.4	49.4	21.7	84.5	36.6	268.9	117.1	16.8	8.3	4.5	2.3	55.5	24.7	91.3	42.8	1,082.1	475.8
Extra Workspaces and Staging Areas	157.0	-	10.2	-	35.8	-	142.8	-	10.2	-	2.3	-	25.5	-	43.6	-	427.5	0.0
Access Roads	92.9	-	13.8	-	9.5	-	143.4	-	10.4	-	5.9	-	16.8	-	3.2	-	295.9	0.0
Yards	53.5	-	0.1	-	-	-	0.6	-	0.3	-	0.2	-	-	-	21.7	-	76.4	0.0
Aboveground Facilities	1.2	1.2	4.8	4.8	-	-	-	-	-	-	-	-	-	-	10.3	10.3	16.3	16.3
Subtotal	815.9	223.7	78.3	26.4	129.8	36.6	555.6	117.1	37.7	8.3	12.9	2.3	97.9	24.7	170.2	53.1	1,898.2	492.1
Total	**9224.8**	**2217.3**	**2519.6**	**793.2**	**346.5**	**87.1**	**577.1**	**122.4**	**205.9**	**45.6**	**1055.7**	**308.4**	**788.0**	**193.0**	**1021.4**	**227.3**	**15739.0**	**3994.4**

a Habitat surveys have not been completed for some portions of the project. Vegetation impacts for 1,779.30 acres of unsurveyed areas are not represented in the table. North Pacific Wooded Volcanic Flowage vegetation impacts (2.2 acres during construction and 0.3 acre during operation) in Oregon are not represented in this table.

Con. = Acres of vegetation within the 115-foot-wide construction workspace, including the operation 50-foot-wide permanent right-of-way.

Op. = Acres of vegetation within the 50-foot-wide permanent right-of-way of the mainline and lateral pipeline.

Impacts on juniper woodland, mountain meadow/brush, and salt desert scrub (3,654.2 acres, or 23.2 percent of the vegetation impacted by the project) would be long-term due to the time required to reestablish the vegetation characteristic of these community types. The arid environment in these regions is not conducive to plant growth, and regeneration of vegetation following construction would be slow. Moreover, the regeneration success of seeded or planted natural vegetation in these areas varies significantly and can be ineffective. Natural regeneration of these areas may take 50 years or longer. Site-specific conditions such as grazing, rainfall amounts, elevation, weeds, and soil type could extend impacts beyond 50 years, or could aid reclamation success and shorten restoration timeframes. Permanent impacts on these shrub habitats would result primarily from right-of-way maintenance activities. Maintenance activities would be conducted in accordance with Ruby's Plan and Procedures (Appendix F), which describe annual vegetation clearing over a 10-foot-wide corridor centered over the pipeline and vegetation clearing every 3 years within the 50-foot-wide permanent right-of-way in non-riparian areas. These clearing activities would prevent larger woody species from returning within the permanent 50-foot-wide pipeline right-of-way.

Impacts on mixed conifer and riparian forested communities (783 acres, or 5 percent of the vegetation impacted by the project) would constitute the most pronounced change in vegetation strata, appearance, and habitat, as mature trees would be replaced for many years by herbaceous plants, shrubs, saplings, and other successional species. The 50-foot-wide permanent right-of-way would be kept free of trees and shrubs in upland areas through selective cutting and vegetation maintenance. The loss of shrub and forested vegetation along the pipeline route as a result of periodic vegetation maintenance would result in habitat fragmentation and subsequent loss of wildlife habitat (see sections 4.4.8 and 4.5.1.2 for more detail). Other impacts resulting from removal of vegetation include increased erosion, sediment runoff, altered soil chemistry, modified infiltration and groundwater recharge rates, an increased susceptibility to invasive or exotic species, increased human activity, and "edge effects" to wildlife. The removal of trees on the right-of-way could also expose trees growing adjacent to the newly cleared areas to higher wind gusts, which could increase the risk of tree blowdowns.

Numerous concerns have been raised about the construction of the project through sagebrush steppe habitat, which is the most dominant vegetation community crossed by the project (9,224.8 acres, or 58.6 percent of the vegetation impacted by the project). Sagebrush habitat is essential for many of the big game, raptors, migratory birds, and sensitive species in the project area. Fire, weed colonization, livestock grazing, oil and gas development, and drought, among others influences, have reduced or degraded sagebrush habitat in the western United States. A detailed analysis of existing sagebrush habitat along the proposed pipeline route, along with construction and conservation measures to reduce impacts, is provided in section 4.7.

The eastern portion of the Vya Construction Camp site is dominated by grasses and scattered sagebrush, and the remaining camp site is dominated by sagebrush. The site has been heavily grazed by cattle. Sagebrush impacts for the Vya camp have been included in table 4.4.1-2 under "Nevada yards."

The Lakeview Temporary Housing Facility would be located in a highly disturbed area that was previously used for cattle grazing and as pasture. Vegetation consists of low-quality sagebrush and noxious weeds.

4.4.1.2 Construction and Restoration Procedures

The impacts of vegetation clearing can be effectively minimized through the use of special construction techniques, proper restoration measures, and post-construction monitoring. Ruby has developed a set of measures it would use to minimize vegetation impacts during and after construction activities. These measures are fully detailed in Ruby's Plan, Procedures, Restoration and Revegetation Plans, and Noxious and Invasive Weed Control Plan (see Appendices F, L, and T, respectively). In

relatively level terrain, Ruby would attempt to limit grading, topsoil segregation, and ditch line excavation to an approximate 14- to 18-foot-wide pipeline trench. In uneven and steep terrain, up to 195 feet of construction right-of-way width could be subject to clearing and grading for safety and construction needs. Ruby would leave as much sod and root layer intact as practical, which would increase the probability of success for post-construction revegetation and would reduce the potential for weedy native and non-native plant species to become established or spread to uninfested areas (see section 4.4.6).

Ruby has proposed, at a minimum, to segregate topsoil over the trench line and spoil storage area for the entire length of the project except in certain locations as discussed in section 4.2.4. The working side of the right-of-way would be mowed or scraped to allow for equipment passage. In addition, Ruby would segregate topsoil over the entire construction right-of-way (*i.e.*, full right-of-way topsoil stripping) in areas where topsoil and subsoil may mix; in areas of steep slopes, side hills, or cut and fills; where soil compaction or rutting may exceed 6 inches (4 inches on BLM land); or at a landowner's or land-managing agency's request. The existing seedbank within the replaced topsoil should increase revegetation success. However, the results of this process can be less than favorable. Weedy species are among the largest component of grassland seed banks (Rice, 1989; Leck, *et al.,* 1989). The presence of numerous noxious and invasive weed species identified during Ruby's 2008 and 2009 inventories indicate that weed colonization or at least initial recruitment in disturbed sites would likely occur.

Several stakeholders provided comments that the seed mixes provided in Ruby's draft Restoration and Revegetation Plans did not adequately represent the native plant species that would be disturbed by the project. Ruby has subsequently consulted with the BLM, USFS, FWS, Reclamation, and state wildlife agencies to develop proper reclamation procedures, including appropriate seed mixes. Based on recommendations from these agencies, Ruby developed separate Restoration and Revegetation Plans for Oregon, Nevada, Utah, and Wyoming (see Appendix L). Ruby would reseed disturbed lands as specified in these plans so as to expedite revegetation and reduce the potential for weed establishment and soil erosion. The seed mixes specified in Ruby's Restoration and Revegetation Plans include species similar to those currently in the natural plant communities affected in each state and would facilitate the recovery of the preconstruction plant community.

Seeding would be the primary method of reestablishing plants within the right-of-way, extra workspaces, and access roads. However, Ruby has committed to planting container-grown shrubs and bare-root conifer trees in appropriate locations to reestablish important shrubs such as low sagebrush, Wyoming sagebrush, bitterbrush, and Utah serviceberry in critical habitat areas such as greater sage-grouse nesting and pygmy rabbit colonies. Ruby would transplant bare-root ponderosa pine seedlings along the right-of-way where ponderosa pine trees are removed in the clearing operation. Specifically, Ruby has committed to transplanting 150 ponderosa pine seedlings within the Fremont National Forest on the portion of the right-of-way that would not be maintained during operation of the pipeline. Container-grown shrubs and bare-root trees would be planted at stocking rates similar to those prior to right-of-way clearing. Ruby would use tubing would be used to protect the seeding from livestock and wildlife browsing.

Revegetation would be considered successful when the cover and density of non-noxious vegetation within the construction right-of-way is similar to the adjacent undisturbed land. According to Ruby's Plan, Ruby would monitor disturbed areas for the first and second growing seasons after construction. It should be noted that this monitoring timeframe is a baseline requirement adopted from the FERC's Plan. Ruby would be required to monitor the success of revegetation and restore all disturbed areas until restoration and revegetation is deemed successful, regardless of the amount of time this may take. We are fully aware of the amount of time that may be required to restore vegetation and habitats in the arid West. During the restoration phase of the project, landowners may identify areas where

additional seeding or restoration actions may be required, including areas of weed infestations. The FERC and various land managing agencies, as appropriate, would also monitor restoration and revegetation success and would ultimately determine if restoration is successful.

The BLM has stated that it would require Ruby to fence public lands in Box Elder County, Utah. This is due to the precarious nature of the vegetation type the pipeline is crossing and because of low precipitation, soil type, and BLM's firsthand knowledge of the area with regards to stabilization and rehabilitation. The majority of the proposed fence would be located within the disturbance area of the pipeline; therefore, no new disturbance is anticipated from fence construction. In an effort to minimize the number of miles of fence constructed, in the few areas where the fence location would be outside the immediate construction disturbance, strategic fencing locations would be examined by the BLM and utilized within the project survey resource clearance areas. In areas where the BLM determines vegetation needs to be reduced, mowing would be done to reduce mature brush and leave smaller vegetation intact, enhancing re-growth potential. This technique would only be used in isolated areas, given that most of the vegetation throughout this section of pipeline is not tall enough to inhibit fence construction. The fencing would follow BLM construction standards and specifications (ref. Manuals H-1741-1 Karsky [1988]) for fences. BLM would then make the determination when the fence can or should be removed based on the "success" of the rehabilitation efforts. Fence locations and specifications are referenced in Ruby's POD.

Pasture would be susceptible to an increase in weed species; however, restoration practices proposed by Ruby should minimize weed colonization. One commenter expressed concern that the project would negatively impact natural grass pasture on their property and inquired how Ruby would propose to restore natural grass pasture to its preconstruction state. Ruby indicated that it would replant native grass pastures in accordance with NRCS or landowner recommendations. Ruby would be required to monitor all disturbed areas to determine the success of restoration, including natural grass pasture, and restore land until restoration and revegetation is deemed successful.

The project would require the use of temporary contractor and pipe yards that would affect a total of 1,070.3 acres of land. About 90.3 acres of agricultural land would be used for these yards. Restoration in agricultural areas would generally occur within 1 to 3 years. About 170.5 acres of sagebrush steppe, 74.8 acres of salt desert scrub, 3.7 acres of grassland, 0.6 acre of mixed conifer forest, 0.3 acre of riparian forest, and 0.2 acres of mountain meadow/brush would also be utilized for yards. Removal of shrubland would result in long-term or permanent impacts due to the length of time needed to restore shrubland to preconstruction conditions. Herbaceous and grassland areas affected by contractor and pipe yards would revegetate in a shorter timeframe. About 504.0 acres of land required for project yards have not been surveyed. We conducted an aerial photo assessment of this land and determined that much of the area was previously disturbed and likely would have low habitat value.

The pipeline right-of-way could be managed to create a fire break. Excess fuel such as vegetation, debris, and detritus could be removed and appropriate vegetation planted to minimize and control the spread of fires. Land managing agencies would determine the necessity of maintaining the pipeline right-of-way as a fire break and would coordinate with Ruby to implement the appropriate restoration and maintenance procedures should a fire break be necessary.

4.4.1.3 Aboveground Facilities

Construction of Ruby's aboveground facilities (*i.e.*, compressor stations, meter stations, pig launchers/receivers, and MLVs) would convert about 61.3 acres of sagebrush steppe, 60.5 acres of salt desert scrub, 12.8 acres of pasture and agriculture land, and 2.9 acres of grassland to aboveground natural

gas facilities (see table 4.4.1-2). We do not consider this to be a significant impact as this represents a very small percentage of the total available land of similar type in areas adjacent to the project.

4.4.2 Vegetation Communities of Special Concern or Value

Rogger Meadow, located in the Fremont National Forest, contains a colony of camas (*Quamasia quamish*) (a bulb flower that grows in wet meadows) and is managed under the Fremont Forest Plan as Management Area 7, a Special Management Area. This area was established in 1939 to protect the camas. The goal of the management area is to provide an attractive, natural-appearing forest character in areas that possess unique or special biological or physical character. Rogger Meadow is characterized by a landscape depression which allows water to accumulate in the meadow area. Sufficient water is important to the survival of the camas, and the local population therefore depends on water flow to the depression. The proposed pipeline route would cross the northern portion of Rogger Meadow; however the crossing angle would not establish a barrier to water movement. Water would still be able to flow above and below the installed pipe. Ruby personnel have reviewed the pipeline alignment in the field with various personnel from the Fremont National Forest. The Fremont National Forest personnel determined that the proposed route was acceptable.

Only about 96 acres of the Rogger Meadow drainage area would be upstream of the project. This acreage represents about 5 percent of the meadow's entire 1,910-acre drainage area. The project would be constructed north of all known inlets and intermittent streams that provide water to the meadow. The ground slopes upward on both sides of the meadow; therefore, the trench would be unlikely to capture or divert flow from the meadow. If necessary, Ruby would install trench breakers where the pipeline enters and exits the meadow. Ruby also would replace the original soil from the trench during backfilling and would restore the soil's original profile as close to preconstruction conditions as possible. These measures would restore the original drainage of the right-of-way; therefore, construction of the pipeline would not be expected to affect the hydrologic regime of the meadow or otherwise impinge on the health of the meadow and the associated camas habitat.

4.4.3 Riparian Habitats

Riparian habitats are essential in maintaining hydrologic, geomorphic, and ecological processes that directly affect standing and flowing waterbodies such as lakes, ponds, wetlands, streams, and stream tributaries. These habitats provide food, cover, and a migratory corridor for a wide variety of terrestrial species; protect waterbodies and provide cover and habitat for fish and other aquatic species; and provide numerous recreational opportunities such as fishing, hunting, hiking, and camping.

Construction of the pipeline (including access road improvements and new access road construction) would affect an estimated 205.9 acres of forested riparian habitat. Approximately 45.6 acres of forested riparian habitat would be permanently maintained as herbaceous vegetation within Ruby's permanent pipeline right-of-way, and 51.9 acres may be impacted by access road improvements and new access road construction. Approximately 157.2 acres of forested riparian habitat would eventually be restored to its original condition; however, this would be a long-term impact as these areas may not return to their original character and function for several decades or longer. We have reviewed Ruby's data, construction alignment sheets, and aerial photography and identified 14 woody riparian areas, including both forested and shrub habitat, that form a unique vegetation corridor as compared to the surrounding landscape (see table 4.4.3-1).

Because of the high wildlife value and stream protection that riparian areas provide, it is essential that impacts on woody riparian areas be minimized to the greatest extent practicable. Therefore, **we recommend that Ruby limit its construction right-of-way width to 75 feet in the woody riparian**

habitats identified in table 4.4.3-1 of the EIS. For any location where Ruby believes temporary extra workspaces/staging areas are necessary in woody riparian habitat, Ruby should provide site-specific justification for review and written approval from the Director of OEP prior to using the temporary extra workspace or staging area. In addition, Ruby should plant woody riparian vegetation (*e.g.*, shrubs, cuttings, seedlings, saplings) in all woody riparian areas (except directly over the trenchline) as soon as possible after construction within the appropriate planting season, including the riparian areas impacted by access roads. Ruby should consult with the landowner or appropriate land managing agency to identify the species and planting densities to be used and any methods to protect planted riparian areas from grazing and browsing impacts, such as browse protection or fencing, until these areas become established. Ruby should monitor the success of riparian habitat restoration for 5 years after construction. At the end of the 5-year period, Ruby should file a report identifying the status of the woody riparian restoration and the need for any additional restoration efforts.

Ruby is coordinating with the FWS, BLM, and state resource agencies to minimize short- and long-term impacts on riparian habitats. Specific conservation and mitigation measures have yet to be identified; however, Ruby has identified a number of measures it could implement to reduce and mitigate project impacts on riparian habitat and the species that utilize these habitats, including:

- acquiring title or easement to private lands adjacent/near the pipeline that could be managed or preserved as riparian habitat. Alternatively, Ruby could find and acquire these easements or properties and deed them to a federal agency or a conservation organization or trust;
- acquiring title or easement to private lands to block up ownership with the BLM or USFS to increase connectivity. Alternatively, Ruby could find and acquire these easements or properties and deed them to a federal agency or a conservation organization or trust;
- fencing or otherwise excluding cattle from sensitive areas to protect/enhance habitat;
- restoring degraded riparian habitats through off-site revegetation projects;
- conducting off-site in-stream habitat improvement projects;
- acquiring conservation easements to protect or improve important riparian habitats;
- installing fences in allotments to improve riparian habitats; or
- decommissioning of roads identified by the BLM and USFS that are no longer needed for resource management, which could provide the following benefits:
    - lower road density;
    - minimization of channel extensions;
    - minimization of sedimentation;
    - improvement of fish passage through culvert removal; and
    - reduction of riparian habitat fragmentation.

4.4.4 Conservation Reserve Program

The project would cross approximately 5 miles of land enrolled in the CRP. The CRP is managed and administered by the USDA's FSA. The program provides eligible farmers and ranchers both technical and financial assistance to conserve and protect soil, water, and related natural resources on their land. It also provides these individuals guidance and assistance in complying with federal, state, and tribal environmental laws and, therefore, helps enable environmental enhancement.

TABLE 4.4.3-1

Woody Riparian Habitat Crossed by the Ruby Pipeline Project

Waterbody	Location (MP)	Length of Riparian Habitat East/South of the Waterbody (feet)	Length of Riparian Habitat West/North of the Waterbody (feet)
Little Muddy Creek	19.8	50	100
Woodruff Creek	60.8	50	150
East Fork Little Bear River	77.9	50	50
East Fork Little Bear River	92.7	~ 2,500	120
South Fork Little Bear River	94.8	120	500
Little Bear River	94.9	190	40
Bear River	113.7	50	-
Tributary to Brush Creek	267.5	11	11
Brush Creek	267.8	-	4
Pole Creek	280.2	20	-
Mary's River	300.0	50	150
Tributary to Indian Creek	315.1	200	-
North Fork Humboldt River	316.3	40	40
Gance Creek	329.2	50	50
Unnamed stream	R350.0	12	-
Tributary to Willow Creek	358.1	50	50
Tributary to Willow Creek	358.4	50	50
Soldier Creek	359.3	50	50
Unnamed [a]	R378.6	50	-
Unnamed [a]	413.5	-	20
12-Mile Creek [a]	588.3	100	100
Unnamed [a]	R105.1	100	-
Unnamed [a]	R105.6	40	-
Brush Creek [a]	269.6	4	-
West Brush Creek [a]	270.3	2	-
Pole Creek [a]	279.4	-	100
Pole Creek [a]	279.6	-	100
Pole Creek [a]	280.0	-	50
Pole Creek [a]	280.2	-	50
Hot Springs Creek [a]	301.8	100	-
Unnamed [a]	505.9	10	-
Unnamed [a]	514.2	-	50
Unnamed [a]	514.4	-	25
Unnamed [a]	573.6	-	6
Dry Creek [a]	630.0	-	20
Unnamed [a]	R671.9	10	-

a Woody riparian habitats that would be impacted by access road improvements

Short- and long-term impacts on CRP land would generally be the same as impacts described for pasture and grassland. To minimize impacts and ensure site stabilization and revegetation Ruby would implement its Plan and Restoration and Revegetation Plans. Ruby would implement full right-of-way topsoil segregation or the ditch-plus-spoil-side topsoil segregation method in CRP land. Ruby also would reseed disturbed areas with a seed mix recommended by the NRCS, FSA, or the landowner.

4.4.5 Vegetation Habitat Categorization

Each state crossed by the proposed project has developed habitat conservation programs to protect sensitive and high quality habitats used by fish and wildlife. These programs identify key habitats or present a framework to assign "quality categories" to habitat types impacted by development projects based on the relative importance and/or availability of habitats to fish and wildlife and the status of species associated with impacted habitats. These programs also guide the development of conservation and mitigation goals.

Ruby, the FWS, BLM, and some state agencies worked together to map and categorize habitat quality along the project and develop conservation and mitigation strategies to minimize and mitigate impacts on high-quality habitat and those species that depend on those habitats. As part of this cooperative effort, a "mile-by-mile" habitat analysis was completed for big game, greater sage-grouse, pygmy rabbit, and various other species. Detailed results of the habitat analysis are provided in Appendix M and are summarized in table 4.4.5-1. A detailed description of the habitat categories is also provided in Appendix M. Generally, category 1 is high-quality habitat while category 4 is low-quality habitat. We note that FWS and some state agencies question the validity of various data inputs and parameters and state that the data are not representative of actual habitat quality.

Identifying high-quality habitat for sensitive and big game species is a key step in determining where to implement avoidance and/or conservation measures. Ruby and various agencies are working together to identify key areas where minor route variations could be adopted to avoid or minimize impacts on high-quality or unique habitats. Several construction techniques and conservation measures have also been developed to minimize habitat impacts and aid in restoration efforts. Many of these construction and conservation measures are included in conservation agreements and other plans that are being developed between Ruby, the BLM, state agencies, and the FWS and are included in draft form in Appendix M. These conservation agreements and other plans are discussed in more detail in sections 4.5.5, 4.7.2, and 4.7.3. Ultimately, the adoption and implementation of the conservation agreements and other plans would minimize habitat impacts; promote restoration success; and ensure that sensitive species, big game, and migratory bird populations are maintained and enhanced in the project area.

4.4.6 Noxious Weeds and Other Invasive Plants

Noxious weeds and other invasive plants are non-native, undesirable native, or introduced species that are able to exclude and outcompete desirable native species, thereby decreasing overall species diversity. The term "noxious weed" is legally defined under both federal and state laws. Under the Federal Plant Protection Act of 2000 (formerly the Noxious Weed Act of 1974 [7 USC SS 2801-2814]), a noxious weed is defined as "any plant or plant product that can directly or indirectly injure or cause damage to crops, livestock, poultry, or other interests of agriculture, irrigation, navigation, the natural resources of the United States, the public health, or the environment." The Federal Plant Protection Act contains a list of 137 federally restricted and regulated federal noxious weeds, including 19 aquatic and wetland weeds, 62 parasitic weeds, and 56 terrestrial weeds (7 CFR Chapter III, Part 360). Each state is federally mandated to uphold the rules and regulations set forth by the Federal Plant Protection Act and manage its lands accordingly.

TABLE 4.4.5-1

Habitat Quality Along the Ruby Pipeline Project

	Category 1	Category 2	Category 3	Category 4	None
WYOMING					
Greater sage-grouse (miles)	33.8	12.0	2.4	-	-
UTAH					
Greater sage-grouse (miles)	42.6	50.4	71	20.8	-
Pygmy rabbit (miles)	2.5	-	-	-	-
Sharp-tailed grouse (miles)	22.5	20.9	24.2	117.2	-
Burrowing owl (miles)	10.8	36.0		138.0	-
Mule deer (miles)	89.5	15.2	13.9	66.2	-
Moose (miles)	32.8	20.4	-	131.6	-
Elk (miles)	56.1	-	-	128.7	-
Pronghorn antelope (miles)	7.4	86.5	14.2	76.7	-
NEVADA					
Greater sage-grouse (miles)	66.5	89.4	70.8	14.6	123.7
Pygmy rabbit (number of sites)	1	10	-	-	-
Mule deer (miles)	76.5	95.5	160.7	37.8	-
OREGON[a]					
Greater sage-grouse (miles)	-	3.5	10.0	12.0	59.0
Pygmy rabbit (number of sites)	-	-	-	-	-
Big Game Habitats			(see Appendix M)		

a The ODFW's Mitigation Goals and Standards consists of a six-category system to mitigate impacts on fish and wildlife habitat from land and water developments. Ruby's Habitat Category Matrix differs from the ODFW Habitat Mitigation Goals and Standards categories. The ODFW agreed to use the habitat classification matrix identified in Appendix M for mapping purposes. The ODFW Mitigation Goals and Standards are still applicable for mitigation purposes.

Noxious weeds are addressed by Executive Order 13112, which directs federal agencies to prevent the introduction of invasive species; provide for their control; and minimize the economic, ecological, and human health impacts that invasive species can cause. The Executive Order further specifies that federal agencies shall not authorize, fund, or carry out actions likely to cause or promote the introduction or spread of invasive species in the United States or elsewhere unless it has been determined that the benefits of such actions outweigh the potential harm caused by invasive species and that all feasible and prudent measures to minimize the risk of harm will be taken in conjunction with the actions.

In addition to federal noxious weed lists, each state crossed by the project maintains a list of regulated and prohibited noxious and invasive weed species. County weed control boards or districts are present in most counties crossed by the pipeline route. These county weed control boards monitor local weed infestations and provide guidance on weed control.

Vegetation communities are more susceptible to infestations of invasive or noxious weed species following soil disturbances. Vegetation removal and soil disturbance during construction could create optimal conditions for the establishment of undesirable species. Noxious weeds could adversely affect an area when invasive plants become established or when an existing species' population size increases. Invasive or noxious plants could negatively affect habitat by competing for resources such as water and light, changing the community composition, eliminating or reducing native plants, or by changing the vegetation structure. The changes in community composition or vegetation structure could reduce native plant populations and can also negatively affect habitat for wildlife. Soil disturbance and/or removal of existing vegetation for pipeline or road construction could provide openings for invasive or noxious plants to establish or spread. Movement of equipment along the construction right-of-way and along access roads also could provide opportunities for seed transport into new uninfested areas. In general, habitats with more bare ground, such as cropland, sagebrush, salt desert scrub, and relatively dry or open forests are more susceptible to invasion than areas that have relatively closed canopy cover or have extreme climate or soils that are tolerated by fewer noxious weeds. Due to the connectivity of lands by access roads, the potential effects of invasive or noxious weeds would not be limited to the project's area of disturbance.

Ruby consulted with the BLM, USFS, and various other federal, state, and local agencies for recommendations to prevent the introduction or spread of noxious and invasive weeds. Various agencies provided known locations of weed infestations and provided recommendations for weed prevention, control, and treatment. Based on the agency recommendations, Ruby developed a Noxious and Invasive Weed Control Plan (Appendix T) to minimize and control the spread of noxious and invasive species. To complement agency weed data, Ruby conducted surveys along the proposed pipeline right-of-way in 2008 and 2009 to identify locations of existing noxious and invasive weeds. Data from the 2009 field season are still being incorporated into Ruby's Noxious and Invasive Weed Control Plan. Ruby would continue to survey for and document the location of noxious and invasive species until construction, and would update its Noxious and Invasive Weed Control Plan with new information as it is identified. Some of the minimization and control measures outlined in Ruby's Noxious and Invasive Weed Control Plan are discussed below. All measures are detailed in Appendix T.

- Ruby would inform and train construction contractors regarding noxious weed management, weed identification, and the potential impacts of noxious weeds on agriculture, livestock, and wildlife. Qualified biological monitors approved by the BLM and USFS, as appropriate, would conduct the training and would provide on-site biological monitoring before, during, and after construction on federal land.

- Equipment and vehicle cleaning would be carried-out using power or high-pressure equipment to remove seeds, roots, and rhizomes prior to arrival at the project right-of-way. Cleaning would concentrate on tracks, feet, or tires and on the undercarriage, with special emphasis on axles, frames, cross members, motor mounts, the underside of running boards, and front bumper/brush guard assemblies. If the weather conditions and right-of-way conditions were dry, compressed air would be used to clean vehicles and equipment. If muddy conditions exist, a mat platform with containment would be set up and the vehicles and equipment would be cleaned with high-pressure water. In Oregon, additional equipment cleaning would occur as equipment entered and/or exited the

medusahead rye infestation area from approximately MPs 611 through 615. Equipment mat platforms would be disinfected with a hot bleach/water solution or other approved cleaning method prior to being transferred off-site when construction in an area was completed.

- Ruby would stockpile cleared vegetation and salvaged topsoil adjacent to the area from which they were stripped to eliminate the transport of soil-borne noxious and invasive weed seeds, roots, or rhizomes. Weed-infested stockpiles would be marked with clearly visible signage until reclamation, when the contractor would return topsoil and vegetative material from infestation sites to the areas from which they were stripped. In addition, the contractor would not be permitted to move soil and vegetative matter outside of the identified and marked noxious weed infestation areas. No construction equipment would be allowed to work in or on these areas and stockpiles.

- Ruby would ensure that straw or hay bales used for sediment barrier installations or mulch distribution, where appropriate, are certified weed-free and obtained from state-cleared sources. If certified weed-free bales are unavailable, alternative weed-free sediment barrier installations would be utilized.

- Reclamation of disturbed lands would occur immediately following construction as outlined in Ruby's state-specific Restoration and Revegetation Plans. Continuing revegetation efforts would ensure adequate vegetation cover to prevent the invasion of noxious weeds.

- Ruby would take appropriate action (including the potential use of herbicides) prior to construction on identified weed infestations to reduce the spread or proliferation of weeds. Applications would be controlled to minimize the impacts on the surrounding vegetation. In areas of dense infestation, a broader application would be used and a follow-up seeding program implemented. Treatment methods would be based on species-specific and area-specific conditions (*e.g.*, proximity to water, riparian areas, or agricultural land; time of year) and would be coordinated with regulatory offices.

Ruby has committed to power-wash all equipment with water at temperatures greater than 230 degrees Fahrenheit (°F) (steam cleaning) prior to and upon leaving Reclamation property to prevent the spread of invasive weed species. This requirement, along with the measures outlined in Ruby's Noxious and Invasive Weed Control Plan, would comply with the management goals of the Integrated Pest Management Plan for the Langell Valley Irrigation District.

The FWS has recommended that treatment for invasive species be conducted prior to equipment entering the Sheldon NWR, including all proposed access roads as discussed in section 4.8.3.5. The FWS would incorporate invasive species treatment requirements into any authorization it would issue to Ruby to ensure that treatment would be completed in compliance with FWS standards.

Ruby would begin monitoring the project right-of-way for infestations of noxious and invasive species in the first growing season after construction (spring 2011) and would continue to monitor the project area biannually (spring and fall) until 2015. Additionally, Ruby would maintain ongoing communication with individual landowners, counties, and land management agencies regarding noxious weeds within the respective jurisdictions. These parties may also contact Ruby to report the presence of noxious weeds for the life of the project. Ruby would control the weeds on a case-by-case basis and include a summary of actions taken in the Reclamation Report for that period. Ruby would maintain

operations personnel trained in the identification of noxious weed species, who would contribute to monitoring reports by documenting noxious weeds observed during the normal course of maintenance. In this way, the project right-of-way would be monitored on an ongoing basis.

Should infestations be identified during monitoring, Ruby would assess the potential for the infestation to spread and would develop a treatment plan to control the infestation. The treatment plan would be developed using integrated weed management principles, and if herbicides are used, all applicable approvals would be obtained prior to their use, including landowner approvals. Only herbicides that are approved for use within treated lands (private, state, or federal) would be used. Ruby has committed to following herbicide and pesticide label instructions. Treatments would not be conducted during precipitation events or when precipitation is expected within 24 hours. Proper buffers would be used if weeds targeted for herbicide treatments are in the vicinity of sensitive sites so as to prevent the spread of herbicides. Ruby would conduct follow-up inspections of treated areas biannually to determine the success of weed control and revegetation, and would continue inspections until revegetation is considered successful or the infestation is eradicated. As previously stated, the FERC and/or the applicable federal land managing agency would ultimately determine if restoration and revegetation is successful and if the project is in compliance with Executive Order 13112.

We conclude that by Ruby's implementation of the procedures identified above and the Noxious and Invasive Weed Control Plan, the spread of noxious and invasive species would be minimized and controlled.

4.4.7 Vegetation Pathogens

During public scoping we received comments about the potential for the project to spread insect parasites and tree pathogens along the construction right-of-way. Several parasites and pathogens are known to occur within the project area, including western pine beetle, Douglas fir beetle, fir engraver, flathead borer, annosus root rot and butt rot, laminated root rot, Port-Orford cedar root disease, dwarf mistletoe, and sudden oak death.

Insects and diseases could adversely affect a forest ecosystem if project activities introduced new infestations or contributed to the spread of existing infestations. Trees may be more susceptible to infestation if damaged during clearing activities and/or have soil compacted over their roots. Construction equipment could transport insects or diseases along the construction right-of-way or in and out of the project area. The spread of insects or disease could result in both short- and long-term effects, such as reduced species diversity and/or a loss of habitat function for wildlife.

Infestations of insect parasites and tree pathogens exist at some locations along the proposed pipeline route. Where specific insect or diseased areas are identified, Ruby has proposed to implement the following measures.

- Western pine beetle – Ruby would remove infested trees in overstocked, infested stands prior to beetle emergence in early June to reduce potential for infestation, as feasible. Also, if a mature ponderosa pine tree is identified with western pine beetle infestation within, but on the immediate edge of the construction right-of-way and would not pose a safety or construction hazards, it would be retained for future snag recruitment to benefit wildlife.

- Douglas fir beetle – Methylcyclohexenone capsules (a natural beetle repellant) would be applied to trees along the edge of the construction right-of-way. This treatment would occur before beetle flight in April to protect remaining stands of Douglas fir and to

prevent the spread of Douglas fir beetle. No Douglas fir down wood 12 inches or larger in diameter would be left in areas on USFS lands where there are known infestations of Douglas fir beetle.

- Fir engraver – Ruby would utilize logging practices that directionally fall timber onto the right-of-way, as well as store logs away from trees adjacent to the right-of-way to minimize or prevent damage to standing trees, when clearing the construction right-of-way within true fir stands. Fresh slash greater than 4 inches provides breeding material for the beetles and can contribute to outbreaks. Ruby would use the BLM and USFS fuel loading specifications to minimize slash accumulations.

- Flatheaded borer – Ruby would minimize damage to adjacent trees when clearing and maintaining the right-of-way, including felling trees within the right-of-way away from adjacent, standing trees.

- Annosus root and butt rot – Sites infected with annosus root and butt rot have been documented. Management to reduce tree loss from *Fomes annosus* (the pathogen responsible for the disease) varies depending on the tree species affected. Dry borax would be applied to freshly cut stumps and wounds inflicted on trees adjacent to the construction right-of-way in areas identified with infestations of annosus root rot, especially when true firs and pine are present. Cut surfaces of all susceptible species would be treated in areas where the disease may be occurring. P-type strain occurs mainly on pines and incense cedar, but also on hardwoods and brush. The s-type strain infects spruces, firs, Douglas fir, western red cedar, and hemlocks.

- Laminated root rot – Infected stands would be documented and planted with resistant conifer species (native cedars, pines, and spruces).

- Dwarf mistletoe – Ruby would consult with appropriate agencies to determine the appropriate plan to minimize the spread of dwarf mistletoe in the event that it is found within the project area.

4.4.8 Habitat Fragmentation and Edge Effect

Forest Fragmentation

The breaking up of contiguous habitats into smaller patches results in vegetation fragmentation and the creation of habitat edges. Forest edges play a crucial role in ecosystem interactions and landscape function, including the distribution of plants and animals, fire spread, vegetation structure, and wildlife habitat. Creation of new forest edge along dense canopy forests could impact microclimate factors such as wind, humidity, and light and could lead to a change in species composition within the adjacent forest or increase invasion by invasive species. Vegetation along forest edges receive more direct solar radiation during the day, lose more long-wave radiation at night, have lower humidity, and receive less short-wave radiation than areas in the forest interior. Increased solar radiation and wind could desiccate vegetation by increasing evapotranspiration, could affect which species survive along the edge (typically favoring shade intolerant species), and could impact soil characteristics. Fragmentation and a loss of habitat connectivity could also impact wildlife (see section 4.5.1.2).

The amount of solar radiation falling on a newly created edge would depend on the direction it faces, its latitude, the time of year and time of day (solar azimuth and solar altitude), and the height of the

trees that would cast shadows on the new edge. Because these values constantly change temporally and spatially, the edge effects would also constantly change along the pipeline, as tree shadows would extend different distances across the right-of-way depending on the time of year. This would result in some areas being in shade at one point in the year (reducing edge effects) and in sunlight during another portion of the year (increasing edge effects). These changing amounts of solar radiation due to tree shadows would occur along the entire route although the shortest shadows (and most solar radiation) would always occur on the summer solstice when the solar altitude is at its maximum.

The natural landscape crossed by the proposed project has already experienced fragmentation in the form of existing roads, other rights-of-way, and clear cuts. However, the pipeline would create approximately 38.6 miles of new forest edge, or 77.2 miles of new forest edge when both sides of the right-of-way are taken into account. This estimate does not include previously clear-cut or regenerating forest. The creation of new access roads in forested areas would also create new forest edges. Temporary extra workspaces would also contribute to fragmentation by creating larger patches within contiguous habitats; however, clearing for the temporary extra workspaces would add to the patch size created along the right-of-way rather than create new cleared patches.

To minimize fragmentation impacts and restore portions of the construction right-of-way, Ruby would replant the construction right-of-way according to its Plan and its Restoration and Revegetation Plan, except within the 50-foot permanent pipeline right-of-way where clearing is necessary to comply with operational safety standards. Timber and slash may be redistributed across the right-of-way following final clean-up. The right-of-way would be seeded in areas deemed acceptable to the landowner or land managing agency in accordance with Ruby's Plan and its Restoration and Revegetation Plan.

We reviewed the project area during a helicopter fly-over in Summer 2008 and also have conducted a more recent aerial photo assessment of the project area. Based on these reviews, we determined that forested areas crossed by the project are intermixed with areas of herbaceous and low shrub habitats. Large contiguous tracts of forested habitat are not common along the proposed pipeline right-of-way. Additionally, numerous unimproved roads and forest roads are located along the project in Oregon. While the project would fragment forested habitats, we believe these impacts would be minimized by implementation of Ruby's proposed restoration practices.

Sagebrush Fragmentation

Sagebrush habitats support a diverse variety of wildlife. The impact of fragmentation on wildlife is discussed in section 4.5.1.2. From a vegetation perspective, impacts of fragmentation on sagebrush would be similar to that discussed for forested areas. Solar radiation, wind desiccation, and evapotranspiration would increase only slightly along the cleared corridor and the newly created sagebrush edge. Herbaceous species used to temporarily revegetate the right-of-way would minimize these fragmentation impacts while sagebrush is allowed to recover and repopulate the right-of-way. However, the recovery timeframe would be long-term along portions of the right-of-way.

4.4.9 Wild Harvesting

Wild harvesting is the act of harvesting food or medicinal products that grow naturally on lands not normally associated with agriculture. Some of the more common non-timber forest products harvested on public lands near the project area include chokecherry, pinyon pine nuts, wild cherry, and various berries, mushrooms, and herbs. Harvesting of non-timber forest products is common on public lands and can occur year-round.

USFS lands and BLM-administered lands crossed by the pipeline require permits to harvest wild products for both recreational and commercial uses. The permit process provides forest managers with the means to track demand for products, the amount of products removed from the forests, and to protect sensitive resources. Some legal (*i.e.,* permitted) recreational and commercial harvesters could be temporarily displaced during pipeline construction, and some of the forest products that are typically harvested would be removed during land clearing phases of pipeline construction. Much of the wild harvesting that occurs on federal land is illegal (*i.e.,* conducted without a permit). The creation of a new pipeline right-of-way and improvement of access roads would create new access into forested areas, and potentially increase the amount of illegal wild harvesting. Ruby would consult with landowners and land managing agencies to determine the most appropriate and effective measures to restrict OHV use and illegal access along the pipeline right-of-way in an effort to limit use of the right-of-way by illegal harvesters. These measures are discussed in section 4.8.1.1.

Several comments were received regarding the potential for the project to impact current and historical wild harvesting areas used by Native Americans. Ruby, the BLM, and the FERC are consulting with Native American tribes to identify wild harvesting areas along the pipeline route and to develop proper avoidance or mitigation measures when crossing identified harvesting areas. These consultations are ongoing and would likely continue throughout the duration of the project. Ruby has proposed to employ tribal construction monitors to ensure that tribal concerns are addressed during the construction and restoration phase of the project. Wild harvesting by Native American tribes is discussed further in section 4.10.

4.4.10 Timber Removal

The pipeline would cross approximately 31.8 miles of mature forested lands in Oregon. Land ownership within forested lands includes privately owned timberland, USFS lands, and BLM-administered lands. The project would cross approximately 7 miles of "complex forest." Complex forest stands are defined as those with a dominant and subdominant canopy based on Lidar remote imagery. The designation of "complex forests" was applied because of difficulties separating mature and old growth forests using remote imagery. The USFS has designated approximately 42,745 acres for management as Old Growth in Management Area 14 within the Fremont National Forest. The proposed pipeline corridor crosses approximately 0.3 mile (6.6 acres) within this management area. The USFS has stated this forest area meets the criteria for old growth forest and according to the USFS, 43 acres of old growth forest adjacent to the stand being crossed by the pipeline would be added to the USFS' existing dedicated old growth management area. The old growth network would be continued as provided by the LRMP. This adjustment in boundary does not impact forest-wide multiple use goals and objectives. The change would not impact current projects nor would adding 43 acres cause any changes in the ability of the Fremont National Forest to achieve long-term goals and objectives. The designation of additional old growth shifts the management focus on a small part of the forest to provide old growth species protection without impacting the ability of the Fremont National Forest to achieve other LRMP objectives. The addition of old growth forest to Management Area 14 is also discussed in section 4.5.1.2.

Ruby stated it would survey the complex forest stands on public and private lands along the pipeline using a protocol obtained from the USFS. The protocol defines old growth forest stands as those having at least 10 trees per acre with a diameter-at-breast height greater than 21 inches. Ruby would also obtain core samples from the largest trees in a forest stand to document tree age. Ruby stated the results of the complex forest survey would be provided to FERC, BLM, the USFS and other appropriate agencies.

All timber cleared from the right-of-way would be cut and cleared in accordance with land owner/land managing agency requirements, where practical. Ruby has proposed to conduct all clearing

operations and tree felling within the certificated construction work limits, and to ensure that trees would be directionally felled or sheared so as to prevent damage to adjacent trees, facilities, or structures. The majority of timber would be removed from the work area as soon as practical. Slash (wood debris created during construction) and logs used for habitat restoration would be decked along the edge of the construction right-of-way or stored within a 25-foot storage area adjacent to the construction workspace.

With BLM or USFS approval, a portion of logging slash would be retained for restoration. Slash used for restoration efforts would be placed in designated areas along the edge of the right-of-way and then scattered or redistributed across the right-of-way during final cleanup and reclamation (following seeding). Ground-based skidding and cable logging methods would be used to efficiently clear timber from the right-of-way. Ruby would implement the following measures to minimize timber clearing impacts as specified in Appendix M.

- Equipment customary to the local area and conventional logging practices would be used to clear and yard logs.

- All tree felling and vegetation clearing would occur within the approved construction work areas. Trees within the construction work areas would be directionally sheared or felled away from existing trees so as to prevent damage to residual trees.

- Logs would be decked along the edge of the right-of-way so as to minimize damage to any residual trees. Logs planned for removal from the site would be hauled off the site as soon as practical following yarding.

- On slopes less than 50 percent, workers would suspend one end of the log while skidding to minimize soil and biotic disturbances. Ruby would make every attempt to minimize soil impacts and maintain duff layers within the right-of-way.

- Logs and slash would be skidded away from streams as much as possible. When necessary, logs and slash would be skidded across perennial streams using matting designed to minimize sediment delivery to streams.

- Logging slash would be hauled to staging areas adjacent to the construction right-of-way to either be hauled off, used in restoration efforts, or burned/chipped at the appropriate time. Slash used for restoration efforts would be placed in designated areas along the edge of the right-of-way and then scattered or redistributed across the right-of-way during final cleanup and reclamation (following seeding). Any burning of slash would be completed in compliance with any state smoke management regulations and registration requirements.

- Forested areas disturbed by the project would be replanted according to federal (*e.g.*, BLM and USFS) and state requirements (*e.g.*, Oregon reforestation rules, Oregon Administrative Rules 629-610-0000 through 629-610-0090). Planting would occur on all forested lands disturbed by the project located more than 10 feet from the centerline of the pipeline.

- Ruby would follow USFS procedures for disposal of merchantable timber cut from USFS lands for construction of the project as described in 36 CFR 223.12. This regulation authorizes the USFS, under the issuance of a right-of-way or special use authorization, to sell the timber directly to Ruby at the current appraised value. Ruby intends to negotiate

one contract covering the crossing in the Fremont National Forest. In the event commercial timber removal is necessary in the Cache National Forest, a separate contract would be negotiated.

Ruby is requesting that the BLM administer the disposal of merchantable timber across BLM-administered lands using the same method that is implemented by the USFS. This approach would allow Ruby to use the same logging contractor, which would provide for a more efficient and timely logging process. We understand that timber disposal procedures would be included as part of the right-of-way grant process with the BLM. The BLM can negotiate a timber sale at current appraised prices for the merchantable trees being removed from the BLM portion of the right-of-way. If this method is implemented, the timber would be appraised by Klamath Falls Resource Area personnel.

Additionally, we note that Reclamation does not have specific procedures in place for disposal of merchantable timber, and because this is not a reservoir construction project, the BLM would be responsible for disposing of merchantable timber on Reclamation land in accordance with the provisions of 586 DM 1. Net receipts from timber sales would be deposited in the Reclamation Fund in accordance with the Act of July 19, 1919 [Sundry Civil Appropriations Act (41 Stat. 163)], or other special fund as authorized.

4.4.11 Fire Regimes

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human intervention, but including the influence of aboriginal burning. In a healthy community with a natural fire regime, fire serves as an integral component to the function and biodiversity of the community; organisms within the community would have likely adapted to withstand and potentially benefit from the fire. Invasive plant species that are introduced to an ecosystem can result in unforeseen changes to a natural fire regime. Their presence increases the incidence of fire in forests and rangelands, and the disturbances resulting from such fires often leads to increased opportunities for invasive plants to take hold. In fact, invasive plants that modify fire regimes cause some of the most extensive ecosystem changes known. Non-native plants can change the fire regime to such an extent that native plants switch from their roles as fire suppressors to fire promoters. Invasive plants that enhance fuel availability can initiate a vicious cycle, actually promoting their own invasiveness while further decreasing the presence of natives, especially those that are more fire-resistant.

We received comments during public scoping suggesting that the removal of native vegetation could result in disturbed areas that are more vulnerable to establishment of invasive species. The BLM has noted that once invasive species become established in an area and ecological thresholds are exceeded, the fire regime can increase (thus, fires may become more likely). The rangelands of the western United States have experienced greatly altered fire regimes with the introduction of cheatgrass (also called downy brome), an annual grass from Eurasia. This grass grows during the cool months of winter and spring and forms prominent hairy leaves. It quickly dries out, leaves numerous seed-filled awned spikelets, and provides a large amount of fuel. Once fire has swept through such an area, cheatgrass can rapidly germinate and produce seeds while native perennial grasses struggle to become reestablished. The presence of cheatgrass increases the occurrence of fire from every 60 to 100 years in native rangelands to every 3 to 5 years (Arid Lands Information Center, 2006). Once this regime has been established, native plants are not able to become reestablished without extensive intervention using primarily chemical control methods to eradicate the cheatgrass. The State of Utah has recommended that Ruby plant *Kochia* (a wildlife-supporting perennial forb that competes successfully against cheatgrass) as a part of its fire regime mitigation strategy. Ruby has incorporated *Kochia* into various seed mixes that it would use in Utah (see Appendix L).

Ruby's Noxious and Invasive Weed Control Plan is designed to minimize and control the spread of invasive species, including cheatgrass, along the project and takes into account agency input and recommendations. According to Ruby's Plan, revegetation would be considered successful when the cover and density of non-noxious vegetation within the construction right-of-way is similar to the adjacent undisturbed land. The FERC and various land managing agencies, as appropriate, would also monitor restoration and revegetation success and would ultimately determine if restoration is successful. Ruby would be required to continue monitoring and restore all disturbed areas until restoration and revegetation is deemed successful. Thus, the likelihood that the project's clearing of vegetation would promote invasive species that would alter the local fire regime is low.

We received comments during public scoping regarding the potential for cleared vegetation or slash scattered within and along the construction right-of-way to increase the local fire regime. According to Ruby's Plan, Ruby would remove construction debris (including vegetation) from all construction work areas during the clean-up process, unless the landowner or land managing agency requests otherwise. Ruby would manage logging slash as outlined in section 4.4.10.

In addition, commenters expressed concern that vehicles traveling along access roads and the construction right-of-way would ignite wildfires, which could then subsequently trigger forest/rangeland fires within adjacent vegetation. All of Ruby's internal combustion engines, stationary and mobile, would be equipped with spark arresters. In addition, Ruby has developed a Fire Prevention and Suppression Plan (Appendix H) to minimize the potential for fires and to facilitate a plan of action should a fire occur. Some of the procedures and measures identified in Ruby's Fire Prevention and Suppression Plan include:

- Identification of key personnel responsible for fire prevention and suppression. Although these personnel have not yet been identified, Ruby would be required to update its Fire Prevention and Suppression Plan and identify such key personnel prior to commencing project activities. Key personnel would be responsible for ensuring all aspects of the Fire Prevention and Suppression Plan, the construction contractor's fire control plan, and implementation of any laws or regulations that pertain to fire prevention and suppression.

- Identification of notification procedures to be used in the event of a fire, using contact information for each land managing agency and fire department within or crossed by the project.

- Definition of fire restriction categories for work areas along the construction right-of-way. Fire restrictions would be issued by the Field Safety Officer on a daily basis and in conjunction with the appropriate federal, state, or local fire management office.

- Inclusion of a 5-pound fire extinguisher in all construction vehicles. Other firefighting tools also would be required in specified vehicles, and water tankers would be required at specific locations along the pipeline right-of-way.

- Prohibition of smoking, except in designated areas as indicated by signage. Torches other than welder and cutting torches, fuses, highway flares, or other devices with open flames would not be allowed.

Ruby and key construction personnel would coordinate with land managing agencies and regional fire departments throughout the project construction period, especially during periods of high or severe fire conditions, to ensure that all permit stipulations are being met and appropriate preventive measures are in place. The Oregon Department of Forestry, for instance, has specifically requested that Ruby

comply with requirements of Oregon Revised Statute Chapter 477 regarding wildfire prevention and suppression. Ruby would coordinate with land managing agencies to determine an appropriate method to remove cleared vegetation along the right-of-way. By implementing these practices and other prevention methods outlined in the Fire Prevention and Suppression Plan, we believe the likelihood of fires as a result of project activities would be small.

4.4.12 Non-Jurisdictional Electric Power Lines

The proposed Rocky Mountain Power electric transmission and distribution line right-of-way is dominated by sagebrush community. Species composing the shrub layer include Wyoming big sagebrush, Great Basin sagebrush, low sage, black sagebrush, and green rabbitbrush. Species observed in the herb layer include cheatgrass, bluebunch wheatgrass, Sandberg bluegrass, Indian ricegrass, stemless goldenweed, hooker sandwort, phlox species, and lupine species. Small, isolated stands of high-quality sagebrush habitat were documented by Ruby field biologists along the power line corridor in June 2009. The proposed Harney Electric Cooperative electric distribution line right-of-way is dominated by greasewood, spiny hopsage, big sagebrush, green rabbitbrush, Russian thistle, and annual grasses.

Construction and maintenance of the electric power lines would occur in areas dominated by sagebrush and other low profile vegetation. Vegetation would only be cleared for the pole locations, and the ground would be graded only as needed to provide safe and efficient operation of construction equipment. Vegetation within the rights-of-way could be damaged by heavy equipment and vehicle movement during construction. Following construction, the rights-of-way would be allowed to recover to their preconstruction conditions. Vegetation impacts due to the proposed work would be minor.

Herbicides would be used during maintenance for control of woody-stemmed vegetation within the rights-of-way. As a result of herbicide application, vegetation in the right-of-way would be limited to low-growing plant species including shrubs, ferns, grasses, forbs, and woody-stemmed species controlled by herbicides. Over time, the taller growing tree species would be eliminated. Through usage of herbicides, low growing plant communities could become better established because the woody-stemmed species would be reduced or eliminated, providing more open areas for these communities to thrive.

Non-target plants could be impacted from spray-over, drift, or accidental spillage/discharge of herbicides. However, through proper application techniques such impact can be minimized and managed. Application of herbicides would comply with the applicable federal and state laws regarding the use of pesticides and would be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. BLM approval would be required prior to the use of pesticides on BLM-administered land. Ruby would seek landowner approval before applying pesticides or herbicides on privately owned land.

4.5 WILDLIFE

The project area would encompass a wide diversity of animal taxa, including large and small mammals, raptors, waterfowl, and various reptiles and amphibians. General impacts on these wildlife resources are discussed in the following sections. Detailed information is also provided for sensitive wildlife that occur in the project area, including raptors and other migratory birds, as well as for managed and sensitive wildlife areas that would be affected by the project.

4.5.1 Wildlife Resources

The project area consists of diverse wildlife habitats and a diverse array of wildlife species. The vegetation characteristics of each habitat (*i.e.*, height, type, and extent of coverage) are the most important factors for determining a species presence or absence at a particular site.

Table 4.5.1-1 provides a partial list of species that are known to occur or could occur in the project area. Several of the species are opportunistic and have adapted to degraded habitats or have expanded their range as a result of landscape fragmentation and land use change.

4.5.1.1 General Wildlife Impacts and Mitigation

Pipeline construction would have direct, indirect, short-term, and long-term impacts on wildlife resources. As defined in section 4.0, short-term impacts generally require the resource to return to preconstruction conditions within 3 years following construction. Long-term impacts require anywhere from 3 to 50 years to return to preconstruction conditions. Permanent impacts would occur when preconstruction conditions are not restored within 50 years. Direct impacts on wildlife habitat, whether by vegetation removal, conversion of one type to another, alteration of key components, or degradation due to proximity of disturbances, also indirectly affect wildlife populations. Such indirect impacts on wildlife are often subtle and difficult to document. The severity of impacts would depend on factors such as the sensitivity of the species impacted, seasonal use patterns, type and timing of project activities, and physical parameters (*e.g.,* topography, cover, forage, and climate).

Construction of the Ruby Pipeline Project would disturb about 15,739 acres of wildlife habitat (see table 4.4.1-2). Construction of the project would have long-term impacts on the majority of the wildlife habitat crossed. Due to the arid conditions in the project area and the sensitivity of many of the habitats crossed by the project, vegetation in certain habitats could be permanently impacted. Additionally, habitat that is converted to an aboveground facility, is maintained along the 50-foot-wide permanent pipeline right-of-way, or is permanently improved by the construction of access roads would be permanently impacted.

The impact of the project on wildlife species and their habitats would vary depending on the habitat requirements of each species and the existing habitat present along the pipeline route. Direct impacts from construction would include the displacement of wildlife along the pipeline right-of-way and access roads and direct mortality of some individuals. Larger or more mobile wildlife, such as birds and large mammals, would leave the vicinity of the right-of-way as construction activities approach. Construction would also disrupt bird courting or nesting and wildlife breeding behaviors on and adjacent to the right-of-way, depending upon the season in which construction occurs. Much of this wildlife would relocate into similar habitats nearby; however, if there were a lack of adequate territorial space, inter- and intra-specific competition and lower reproductive success and survival may result.

The influx and increased density of animals in nearby undisturbed areas could also reduce the reproductive success of animals that are not displaced by construction, and increase the risk of predation in the area. Additionally, some smaller, less mobile wildlife, such as small mammals, reptiles, and amphibians could be crushed by construction equipment or trapped in trenches. These effects would diminish after construction, and wildlife could return to the newly disturbed areas and adjacent, undisturbed habitats after right-of-way restoration is completed and access roads are restored or their use is no longer required. Wildlife populations would return to preconstruction levels previous to development only if suitable habitat is restored.

TABLE 4.5.1-1

Wildlife Species Common to the Ruby Pipeline Project Area

Category	Species Name
MAMMALS	
Big Game	Elk, moose, white-tailed deer, pronghorn antelope, mule deer, big-horn sheep
Small Game and Non-Game	Great Basin ground squirrel, Belding's ground-squirrel, golden-mantled ground squirrel, least chipmunk, northern pocket gopher, white-tailed prairie dog, kangaroo rat, bushy-tailed woodrat, pocketmouse, deer mouse, northern grasshopper mouse, Ord's western jumping mouse, meadow vole, montane vole, pygmy rabbit, mountain cottontail, desert cottontail, white-tailed jackrabbit, black-tailed jackrabbit, Merriam's shrew, western small-footed myotis, little brown myotis, silver-haired bat, beaver, river otter, muskrat, porcupine, yellow-bellied marmot, cougar, bobcat, coyote, kit fox, northern raccoon, western spotted skunk, striped skunk, long-tailed weasel, badger, gray squirrel, ground squirrel, Wyoming ground squirrel
BIRDS	
Upland Game Birds	Ring-necked pheasant, gray partridge, dusky grouse, ruffed grouse, greater sage-grouse, sharp-tailed grouse, California quail, mountain quail, chukar, mourning dove, wild turkey
Wading Birds	American avocet, white-faced ibis, sandhill crane, killdeer, spotted sandpiper, long-billed curlew, Wilson's snipe, black-crowned night heron, great blue heron, great egret, Forster's tern, willet, Wilson's phalarope
Water Birds	American white pelican, California gull, Franklin's gull, ring-billed gull, cinnamon teal, merganser, northern shoveler, mallard, gadwall, green-winged teal, northern pintail, Canada Goose, redhead, western grebe
Raptors	Bald eagle, northern harrier, sharp-shinned hawk, Cooper's hawk, golden eagle, Swainson's hawk, red-tailed hawk, ferruginous hawk, American kestrel, prairie falcon, peregrine falcon, barn owl, western screech-owl, great horned owl, burrowing owl, long-eared owl, short-eared owl, osprey
Other birds	Rock pigeon, nighthawk, poorwill, broad-tailed hummingbird, calliope hummingbird, rufous hummingbird, belted kingfisher, northern flicker, downy woodpecker, hairy woodpecker, Lewis' woodpecker, white-headed woodpecker, red-naped sapsucker, Williamson's sapsucker, blue-gray gnatcatcher, ash-throated flycatcher, dusky flycatcher, gray flycatcher, Hammond's flycatcher, olive-sided flycatcher, western wood-pewee, white-throated swift, bank swallow, barn swallow, cliff swallow, northern rough-winged swallow, tree swallow, violet-green swallow, Say's phoebe, eastern kingbird, western kingbird, loggerhead shrike, pinyon jay, Steller's jay, western scrub-jay, western meadowlark, dark-eyed junco, black-headed grosbeak, Bullock's oriole, horned lark, northern mockingbird, black-billed magpie, American crow, raven, juniper titmouse, hermit thrush, canyon wren, house wren, rock wren, mountain bluebird, American robin, sage thrasher, brown creeper, pine siskin, lazuli bunting, black-capped chickadee, mountain chickadee, pygmy nuthatch, red-breasted nuthatch, white-breasted nuthatch, warbling vireo, yellow-rumped warbler, MacGillivray's warbler, orange-crowned warbler, black-throated gray warbler, yellow warbler, yellow-breasted chat, green-tailed towhee, spotted towhee, song sparrow, black-throated sparrow, chipping sparrow, Brewer's sparrow, fox sparrow, grasshopper sparrow, house sparrow, lark sparrow, sage sparrow, savannah sparrow, vesper sparrow, white-crowned sparrow, red-winged blackbird, yellow-headed blackbird, Brewer's blackbird, brown-headed cowbird, European starling, Clark's nutcracker, yellowthroat, bushtit, western bluebird, western tanager, American goldfinch, Cassin's finch, lesser goldfinch, house finch
REPTILES	
Turtles	Western painted turtle
Lizards	Western fence lizard, desert collared lizard, Lahontan basin leopard lizard, short-horned lizard, long-nosed leopard lizard, desert horned lizard, sagebrush lizard, side-blotched lizard, western skink, western whiptail lizard
Snakes	Western garter snake, rubber boa, racer, desert night snake, striped whipsnake, garter snake, western rattlesnake, night snake, Great Basin gopher snake, kingsnake, wandering garter snake
AMPHIBIANS	Great Basin spadefoot, green frog, northern leopard frog, western toad, Pacific treefrog, Columbia spotted frog

We received comments on the draft EIS stating that the emission of artificial light at night at compressor stations could have adverse effects to wildlife. Artificial light is known to affect wildlife movement, but not all species respond to light in the same way. Some animals avoid lighted areas at night, while others congregate near lighted areas. Artificial lights have been shown to impact foraging, migration, communication, and reproductive behaviors of various species. A noteworthy impact of

artificial light is its effect on migrating birds. Bright lights are known to disorient migrating birds and interfere with the birds' internal magnetic compasses. Once distracted by artificial light, birds may be reluctant to fly out of the lighted area and often continue to circle in the light beam until they are not longer able to continue with their migration.

Ruby's four communication towers could impact bird flight patterns and increase bird injury or mortality as a result of collisions with towers or support wires or from the station towers' artificial lighting. These towers would be constructed within the four compressor station yards. Noise generated during operation of the compressor stations may to some extent deter birds from flying, foraging, or nesting near the communication towers, and may reduce bird flight impacts. The FWS has suggested that Ruby construct the communication towers in accordance with its *Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers*. These guidelines include recommendations for tower siting, tower height, guy wires, visual markers, and light shielding. We have reviewed these guidelines and believe they provide adequate protection to birds. Therefore, **we recommend that Ruby incorporate into its project design the FWS's *Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers*.**

The cutting, clearing, and/or removal of existing vegetation would also affect wildlife by reducing the amount of available cover, nesting, and foraging habitat. The degree of impact would depend on the type of habitat affected and the rate at which vegetation regenerates after construction. The impact on species that commonly inhabit agricultural land would be relatively minor and temporary because these areas are regularly disturbed and would be replanted during the next growing season. Herbaceous habitats would be restored to a structural condition similar to preconstruction in a relatively short time (*i.e.*, 3 to 5 years). This would be facilitated by reseeding disturbed areas with native seed and by minimizing the disturbance to the existing sod layer in the construction right-of-way. The effect to forest-dwelling wildlife species would be greater because forest habitat would take a comparatively longer time to regenerate and would be prevented from reestablishing on the permanent 50-foot-wide pipeline right-of-way. The impacts on shrub-dwelling species would be comparable to impacts on forest-dwelling species due to the significant regeneration timeframes of these habitats. Such habitats could take 50 years or longer to regenerate, depending on site-specific conditions such as rainfall, elevation, grazing, and weed introduction. However, unlike forested habitats, Ruby would not maintain (*i.e.,* clear) shrubs within its permanent 50-foot-wide right-of-way in sagebrush habitats. Although the structural component of shrub-dominated habitats would recover slowly, successful restoration of non-woody vegetation may improve the forage value for some wildlife species within a relatively short time.

The vegetation fencing that would be required on BLM-administered lands in Box Elder County, Utah (see section 4.4.1.2) is not anticipated to have negative impacts on wildlife species. According to the BLM, the fence would be built to wildlife friendly specifications as outlined in Manuals H-1741-1 Karsky (1988) for fences. Fencing would only be required on public lands and therefore any and all state and/or private lands that are not fenced would continue to allow for wildlife movement.

4.5.1.2 Habitat Fragmentation and Edge Effect

Construction of the project would require clearing approximately 1,129.5 acres of forested habitat, consisting of 346.5 acres of juniper woodland, 577.1 acres of mixed conifer forest, and 205.9 acres of riparian forest. Ruby would maintain a 50-foot-wide right-of-way centered over the pipe during operation of the pipeline. As a result, 255.1 acres of forested habitat would be permanently converted to an herbaceous state for pipeline operation. Fragmentation would also occur where primitive access road improvements and new access road construction are required. Approximately 230.6 acres of forested habitat may be cleared for access road use (this clearing is included in the 1,129.5 acres of "project clearing" described above). Forested habitats outside the maintained pipeline right-of-way and all other

non-forested habitats crossed by the pipeline would be revegetated and restored to their preconstruction condition; however, this could take several years to complete. Sagebrush communities also would be subject to fragmentation and would experience effects similar in nature to those experienced in forested habitats for certain species.

Habitat fragmentation is a frequent concern when clearing and maintaining rights-of-way. In general, fragmentation could result in an altered wildlife community as species more adaptable to edge habitats establish themselves, while species requiring undisturbed habitats are subject to negative effects such as predation, parasitism, or inter-specific competition; reduced pairing and reproductive success; reduced nesting areas; increased destruction of habitat of understory species by browsers; inhibited migration, dispersal, foraging, and other movements of forest interior species that are hesitant to cross openings; and expansion of non-native vegetation. Moist, cool, and stable microclimatic conditions are essential to amphibian species. Fragmentation may affect woodland amphibians by decreasing the amount of cover, prompting changes in ground moisture, and increasing potential exposure to the sun. Habitat fragmentation has already occurred in many areas that would be crossed by the pipeline due to fires, tree harvests, highways, roads, and utility corridors. The cumulative effect of these actions to wildlife are expected to increase in the foreseeable future.

Potential impacts on birds include increased brood parasitism, increased nest depredation in grasslands, and lower nesting success (Thomas and Towiell, 1982; Burger *et al.,* 1994; Marini *et al.,* 1995; Danielson *et al,*. 1997; Brand and George, 2000). Edges provide the brown-headed cowbird, a nest parasite, access to interior forest patches. Effects from such access can extend into forest interiors as far as 600 meters (Norse *et al,* 1986). Nest parasitism by brown-headed cowbirds is especially likely in fragmented shrub-dominated habitats (Vander Haegen and Walker, 1998). A local increase in nest predators (corvids such as black-billed magpie, American crow, and raven) also could contribute additional impacts on breeding birds as a result of edges created by the pipeline right-of-way. Corvids in particular could be attracted to the work areas during construction if trash and food were inappropriately disposed of by work crews.

Potential positive impacts would include increased diversity and density of bird species, increased access to a variety of food resources, and increased ground cover, which would favor ground-nesting species (Rosenberg and Raphael, 1986). The close proximity of cover and forage areas at forest edges provides ideal habitat for many game species. For example, bird species diversity in power line corridors through forested vegetation was found to be higher in the corridor than within the adjacent forest (Kroodsma, 1984). Higher levels of flower and fruit production, pollinator, and frugivore densities and seed dispersal are often found along the edge. In addition, deer, moose, and elk have been documented to use available browsing areas within corridors or on edges of corridors (Hartley *et al.,* 1984; Brusnyk and Westworth, 1985).

To minimize fragmentation impacts on wildlife, Ruby would clear shrubs along the edge of the construction workspace using a zigzag clearing pattern ("feathering") to reduce the creation of hard edges along the edge of the construction workspace; or, if possible, would implement measures to create shrub patches within the pipeline corridor as agreed to by landowners and land-managing agencies. Some large shrubs and trees removed during clearing operations and stockpiled may be used to construct wildlife shelters. These shelters would be constructed after reseeding and container-grown plant placement as a wildlife habitat enhancement measure. Approximately 5 to 8 shelters for every 20 acres of right-of-way in shrub habitats would be established. Shelter size would be commensurate to the adjacent undisturbed habitat. Additionally, Ruby would transplant container-grown shrubs and bare-root conifer trees in appropriate locations within the temporary construction work areas as discussed in section 4.4.1.2. These measures would reduce fragmentation effects of abrupt edge created by construction and operation practices.

As stated in section 4.4.10, the proposed pipeline crosses a portion of dedicated old-growth forest in the Fremont National Forest. There are currently two roads within and adjacent to this forest plot. To ensure old-growth forest is maintained within the National Forest, an additional 43 acres of field verified old-growth forest adjacent to the existing dedicated old-growth forest would be added to the old-growth management boundaries of the Forest Plan. The combined old-growth forest would create a functional block able to provide old-growth habitat consistent with Forest Plan direction. This addition would not change the old-growth grid or pattern across the landscape and connectivity with other blocks of old-growth would be maintained.

4.5.1.3 Noise

Noise could impact wildlife during clearing and grading of the construction right-of-way, during pipeline construction (including any HDD and conventional boring operations), and during right-of-way cleanup and restoration. Ambient sound levels were determined at four noise-sensitive areas along the project (see section 4.11.2.2). Ambient sound ranged from 30 decibels (dB) to 43 dB. Distances at which construction-related noise would attenuate to ambient levels would depend on local conditions such as tree cover and density, topography, weather (humidity), and wind. Noise levels associated with some common machines and activities that would be present during pipeline construction (considering ambient sound as a base) are discussed in section 4.11.2.

Research has demonstrated varying short-term reactions of wildlife to noise; however, specific studies to determine impacts on wildlife from typical pipeline construction noises have not been conducted. Most research has focused on wildlife reaction to noise generated by roads and high-volume traffic (*e.g.,* Forman and Alexander, 1998). However, some research has recorded wildlife reaction to activities that could produce similar reactions from noises associated with pipeline construction activities (airplanes, sonic booms, helicopters, artillery, and blasting). For example, mule deer have been documented to respond to short-duration seismic exploration (blasting) with alert postures. The mule deer observed in the study occasionally ran for short distances after the noise event but did not shift home ranges (Ihsle, 1982). Mule deer did avoid areas of seismic exploration that were closer (0.6 mile away) but whether the avoidance was due to human presence, noise, or a combination of the factors was not distinguishable (Horejsi, 1979).

Construction-related sounds may have an adverse impact on raptors and bird species during nesting and breeding. These impacts occur when noise levels substantially exceed ambient conditions that existed prior to a project (*i.e.*, by 20 to 25 dB, as experienced by the animal) and/or when the total sound level exceeds 90 dB. Such impacts could potentially result in nest abandonment, egg failure, reduced juvenile survival, malnutrition or starvation of the young, or a reduction of the growth or likelihood of survival of young. While this could represent an adverse impact for the first year of compressor station operation as birds in the area are subjected to the novel noise source, we expect that in subsequent years, birds and other wildlife would either be habituated to the noise source, or could move into similar available habitat further from the noise source. This, in turn, could lead to increased competition for preferred habitats, depending on the amount of habitat available. We further discuss potential noise impacts from compressor station operation on the greater sage-grouse in section 4.7.3.1.

Overall, we believe that impacts on wildlife due to construction noise would be of short duration and spatially localized, and that noise impacts from operation would not represent a significant impact on local wildlife.

4.5.1.4 Noxious and Invasive Species

Short- or long-term impacts on wildlife habitat could occur if pipeline construction spreads noxious weeds and other invasive species (see section 4.4.6 for a discussion regarding noxious weed impacts on vegetation). Noxious weeds can outcompete native vegetation and displace native species by spreading rapidly and co-opting resources (*i.e.,* nutrients, water, and sunlight) that can eventually lead to a weed-dominated monoculture. Such transformed habitat can be unsuitable to former wildlife inhabitants. Often, as habitat quality degenerates, wildlife diversity declines. For example, purple loosestrife forms dense monocultures that inhibit native vegetation from flourishing, cause a decrease in species diversity, limit water flow and wildlife access to water, and in some instances make waterfowl nesting areas unsuitable (Whitson, 1996). Scotch broom is another example of a highly aggressive invasive species that becomes rapidly established within open areas, including forest clear-cuts, where it may inhibit reforestation.

Ruby has developed construction and restoration procedures to minimize impacts on wildlife habitat and reduce and control the spread of noxious and invasive plants (see section 4.4.6), vegetation pathogens (see section 4.4.7) and invasive aquatic species (see section 4.6.2).

4.5.1.5 Aboveground Facilities

Construction and operation of the proposed aboveground pipeline facilities (*i.e.*, compressor stations, meter stations, pig launchers/receivers, and MLVs) would have minimal impact on total available wildlife habitat. None of the areas proposed for aboveground facilities are known to harbor critical habitat for federally listed species or species of special concern. Big game crucial habitats impacted by aboveground facility construction are discussed in the following section. We do not consider these impacts significant as the habitat affected represents a very small percentage of total available wildlife habitat in the surrounding project area. However, we acknowledge that construction of the aboveground facilities would constitute a cumulative impact on the affected habitats (see discussion in section 4.5.2).

4.5.2 Big Game Species

The primary big game species occurring in the project area include moose, elk, mule deer, and pronghorn antelope. Bighorn sheep could also be present. Certain habitat ranges for these species are considered crucial for maintenance of game populations. State agencies and the BLM have established several habitat categories based on species' seasonal use of the habitat. For example, crucial winter range areas are used as survival areas during harsh winters and are considered essential in determining a game population's ability to maintain itself at a certain level over the long term. Other habitat categories for big game include winter range, summer range, calving or fawning areas, or year-round range. Table 4.5.2-1 summarizes the linear miles of pipeline that would cross big game crucial winter range along the project route.

The presence of moose in the project area is limited to forested areas in eastern Utah. The project would cross approximately 27.3 miles of crucial winter range for moose. Elk inhabit a variety of habitats along the project route including grassland, shrubland, coniferous forests, aspen, and, to a lesser extent, agriculture and pasture. The project would cross approximately 42.8 miles of crucial winter range for elk in Utah and Nevada and 25.1 miles of winter range for elk in Oregon. Mule deer occur throughout the majority of the project region. Mule deer inhabit virtually all vegetation types but reach the greatest densities in shrublands on rough, broken terrain which provides abundant browse and cover habitat. The project would cross approximately 66.2 miles of crucial winter range for mule deer in Wyoming, Utah, and Nevada and 37.4 miles of mule deer winter range in Oregon. Pronghorn antelope are generally found

in prairie grassland and semi-desert shrubland habitats on flat to rolling terrain with good visibility. They are most abundant in short- or mid-grass prairies and are least common in xeric habitats. The project would cross approximately 21.8 miles of crucial winter range for antelope in Wyoming and Nevada. Bighorn sheep live in alpine meadows, mountain slopes, and foothills and prefer rocky slopes they can climb to evade predators. According to data provided by NDOW, the project would cross about 16 miles of occupied bighorn sheep habitat. In addition to crucial winter ranges, a quality analysis of various big game habitats has been conducted along the project route. Results of this analysis are discussed in section 4.4.5.

TABLE 4.5.2-1

Big Game Habitat Crossed by the Ruby Pipeline Project

State	Big Game Habitat	Designated Construction Avoidance Periods	Pipeline MP Range
Wyoming	Mule Deer Crucial Winter Range	November 15 to April 30	24.5 to 30.0 40.2 to 47.9
	Pronghorn Antelope Crucial Winter Range	November 15 to April 30	19.3 to 25.7
Utah	Moose Crucial Winter Range	November 1 to January 15	60.2 to 73.0 75.1 to 89.6
	Elk Crucial Winter Range	November 1 to January 15	55.4 to 67.4 88.8 to 94.8 95.8 to 105.5
	Mule Deer Crucial Winter Range	December 1 to April 15	47.9 to 51.0 56.1 to 62.6 88.3 to 94.8 95.4 to 109.2 133.4 to 135.2 141.9 to 143.7 154.6 to 157.4 229.2 to 230.8
Nevada	Elk Crucial Winter Range	December 15 to March 15	231.7 to 237.9 247.4 to 256.3
	Mule Deer Crucial Winter Range	December 15 to March 15	230.8 to 239.3 R384.8 to 391.4
	Pronghorn Antelope Crucial Winter Range	December 15 to March 15 in Elko BLM District; November 1 to April 15 in Winnemucca BLM District	270.4 to 275.4 R385.7 to R395.9 R396.9 to R397.1
Oregon	Elk Winter Range	November 1 to April 1	630.2 to 655.3
	Mule Deer Winter Range	November 1 to April 1	588.2 to 601.6 611.0 to 615.4 627.6 to 632.2 R653.9 to R665.1 R667.9 to R671.7

Construction impacts on big game species would include an incremental increase in habitat fragmentation as well as a loss of potential forage within the area of disturbance. However, project-related loss or change in habitat/forage would represent only a small percent of the overall available habitat within the broader project area. Herbaceous forage species would be expected to recolonize quickly. In most instances, suitable habitat adjacent to the disturbed areas would be available for wildlife species until grasses and woody vegetation are reestablished in disturbed areas.

Indirect impacts on big game species could include those caused by increased human activity, augmented noise levels, dispersal of noxious and invasive weeds, and dust effects from unpaved road traffic. Big game animals (especially pronghorn and mule deer) would likely decrease their use of an area within 0.5-mile of surface disturbance activities (Ward *et al.*, 1980; Ward, 1976). This displacement would be short-term and animals would likely return to the disturbance area after construction and restoration efforts are complete. However, assuming the adjacent habitats are at or near carrying capacity, and given the current drought conditions in the project region, displacement of or stress on big game species could cause some unquantifiable reduction in wildlife populations if measures were not taken to minimize impacts during crucial migration periods.

Big game could utilize the newly established right-of-way for travel and foraging following construction. Elk tend to use pipeline rights-of-way for feeding areas, especially when hunting is not occurring (Lees, 1989), and deer use various open areas for foraging (Jageman, 1994). A pipeline right-of-way provides an opportunity for developing high-quality feeding areas for elk and deer, especially if noxious weeds are controlled and native forage is seeded (Lees, 1989). Ruby would seed disturbed areas within big-game winter ranges with native vegetation as described in the Restoration and Revegetation Plans (Appendix L). Additionally, Ruby would control noxious weeds on the right-of-way on all lands crossed, including both summer and winter rangelands.

Construction of the project may coincide with big game calving and fawning times which generally occur in late spring (May to early June). Calving and/or fawning areas may be close to winter ranges or may be at higher elevations than winter ranges. Big game would most likely avoid active construction areas and may be adversely affected in one or more ways, including: increased energy expense due to escape from disturbances, displacement to areas of deeper snow accumulation, use of suboptimal habitats that do not provide adequate functions (food, shelter, escape cover), and use of habitats that increase the risk of predation. The expected consequences of these responses would be a decrease in over-winter survival and possible decrease in calving and/or fawning success. The BLM's Salt Lake Field Office has requested that crucial calving areas be avoided between May 1 and June 30; however, it does not appear that crucial calving areas would be crossed by the project.

Ruby proposes to avoid construction and non-emergency maintenance activities in designated crucial winter big game ranges as identified in table 4.5.2-1. The BLM has requested that Ruby avoid pronghorn antelope migration corridors in the Winnemucca District and Surprise Field Office management areas from April 1 to June 30. The BLM's Elko District has requested that big game intermediate range and migration corridors for big game be avoided between October 15 to December 14 and from March 16 to May 1. Additional construction and restoration procedures that have been proposed by Ruby in big game winter ranges include:

- seeding of disturbed big game winter range areas with preferred big game forage species, as recommended by the BLM, USFS, and state wildlife agencies;
- controlling noxious weeds on the right-of-way on all lands crossed, including both summer and winter rangelands, to help maintain native forage species;
- installing or leaving crossovers at 1,200 foot intervals, near water sources, at existing roads or two-tracks, and at visible livestock/wildlife trails to serve as routes for big game to cross the construction right-of-way until the pipe is ready to be installed. Crossovers would be constructed on each side of stream water sources. Each crossover would be sloped on each side to act as an escape ramp for any livestock/wildlife that happens to become trapped in the trench. Ruby would also inspect the open ditch line daily to ensure that livestock/wildlife is not trapped in the open trench;

- leaving a 10-foot gap in spoil and topsoil stockpiles at all hard or soft plug locations, and a corresponding gap in the welded pipe string. Suitable ramps also would be installed from the bottom to the top of the trench to allow any wildlife that enter the trench to escape. The ramps would be spaced at approximately 0.5-mile intervals in big game migration corridors or within winter range areas; and
- installing OHV barriers after construction is complete to reduce unauthorized public access and to maximize big game use of the right-of-way. These barriers could include dirt/rock berms, log barriers, signs, and locked gates. Slash from clearing operations would also be redistributed on the right-of-way and would help discourage OHV travel.

We received comments from the Klamath Tribes in Oregon that the project may impact mule deer that migrate across the project area. We believe that Ruby's proposed construction practices identified above would not preclude mule deer from crossing the construction work area or otherwise adversely impact mule deer migration.

We also received comments from the Lincoln County Board of Commissioners that seasonal restrictions can have adverse impacts on the environment as well. The board contends that seasonal restrictions concentrate development during seven short months, thus increasing the intensity of the impacts during this period. Because most tourism occurs during the same time, this increases traffic, air emissions, dust, and resulting haze. According to the Board, the seasonal restrictions also make it difficult to attract and keep permanent workers. When workers are needed for only a few months, families do not move into the area and local governments do not realize the full benefits of revenue from property and sales tax. Yet local governments must still provide law enforcement, medical, and other services for the temporary workers. The Board contends there is controversy about the rationale for winter and spring restrictions on big game areas and states that research shows that after initial construction big game return to the area, and as more data are developed, waivers to seasonal restrictions should be granted based on a broader view of the science and current game and wildlife numbers. We could not corroborate the research cited by the Board. We appreciate the Board's perspective on seasonal restrictions for big game; however, all four state wildlife departments have seasonal restrictions for big game and Ruby has agreed to adopt them. For this project, we defer to each state's requirements.

Construction of permanent aboveground facilities (*i.e.*, compressor stations, pig launchers/receivers, meter stations, and MLVs) would result in the permanent loss of critical winter habitat for big game (see table 4.5.2-2). This loss of habitat constitutes a very small percentage of available habitat on a regional basis and is not likely to affect big game populations in the project area.

TABLE 4.5.2-2

Permanent Loss of Big Game Habitat by Construction of Aboveground Facilities for the Ruby Pipeline Project

State	Big Game Habitat Type	Habitat Permanently Lost (acres)
Wyoming	Antelope Crucial Winter Range	0.1
Utah	Elk Crucial Winter Range	2.1
	Mule Deer Crucial Winter Range	2.3
Nevada	Mule Deer Crucial Winter Range	0.1
Oregon	Elk Winter Range	0.1
	Mule Deer Winter Range	0.4

4.5.3 Small Game Species

Small game species within the project region include upland game birds, waterfowl, furbearers, and other various small mammals. Examples include greater sage-grouse, sharp-tailed grouse, dusky grouse, ruffed grouse, California quail, mountain quail, pheasant, chukar, gray partridge, mourning dove, migratory waterfowl, white-tailed jackrabbit, desert cottontail, mountain cottontail, beaver, muskrat, mink, badger, bobcat, coyote, red fox, and swift fox. The greater sage-grouse and pygmy rabbit are likely the most sensitive small game species along the project route and are discussed further in section 4.7.3.

The project's potential impacts on small game would be similar to those discussed above for general wildlife species. Species would be subject to the incremental loss of habitat and increased habitat fragmentation until restoration has been completed and native vegetation is reestablished. Waterfowl could be temporarily disturbed during construction across certain wetlands. Direct impacts on small game species could include nest or burrow abandonment, loss of eggs or young, or death. Indirect impacts could include the temporary displacement of small game from the disturbance areas as a result of increased noise and human presence. We believe that such impacts would be short-term and that animals would likely return to the project area following construction.

4.5.4 Game Harvesting

Construction of the project would cause short-term, localized impact on hunter success rates within the project area. If construction in an area coincides with hunting seasons, hunter utilization and success in the immediate vicinity would probably be adversely affected for the duration of construction. Big game likely would be displaced from habitats adjacent to construction-related disturbance. In general, big game would be expected to return to habitats from which they have vacated after construction and restoration efforts are completed.

Harvest rates could increase after construction by hunters using a new pipeline right-of-way to access remote or previously inaccessible areas (Comer, 1982). In addition, big game species that utilize a cleared right-of-way could be more likely to be harvested than animals in forested habitat. Increased public recreation along cleared rights-of-way in the fall hunting season, especially near crossings of existing access points, has been documented elsewhere (Crabtree, 1984). Increased public access as a result of the newly cleared pipeline right-of-way could increase poaching of game animals and non-game wildlife. Ruby would coordinate with landowners and land managing agencies to determine appropriate responses to OHV and other access issues. Ruby would install fences, gates with locks, blockades, and/or berms to prevent or discourage unauthorized access to the right-of-way, as appropriate.

We received a comment on the draft EIS concerning the potential for increased poaching by construction workers staying at the Vya Construction Camp. Ruby would require each construction camp occupant to read and sign orientation documents that would contain information, including use restrictions, regarding historic and natural wildlife/conservation areas and tribal lands. Ruby would hold its contractors accountable for compliance. Ruby has also stated that it welcomes input from any agencies that would like specific information included in the orientation information.

4.5.5 Raptors and Other Migratory Birds

The MBTA (16 USC 703-711) is a federal law that implements the United States' commitment to international conventions with Canada (1916), Mexico (1936), Japan (1972) and Russia (1978) for protection of shared migratory bird resources (FWS, 2002). The MBTA prohibits the taking, killing, possession, transportation, and importation of migratory birds, their eggs, parts, and nests, except when

specifically authorized by the DOI. Executive Order 13186 (2001) directs departments and agencies to take certain actions to further implement the MBTA. The Executive Order, among other things, directs federal agencies to identify where unintentional takes reasonably attributable to agency actions have, or are likely to have, a measureable negative effect to migratory bird populations, focusing first on species of concern, priority habitats, and key risk factors. With respect to those actions so identified, the agency shall develop and use principles, standards, and practices that lessen the amount of unintentional take, developing any such conservation efforts in cooperation with the FWS.

The BGEPA prohibits knowingly taking, or taking with wanton disregard for the consequences of an activity, any bald or golden eagle or their body parts, nests, chicks or eggs, which includes collection, molestation, disturbance, or killing. The term "disturb" is defined as "to agitate or bother a bald or golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior" (50 CFR 22.3 [72 FR 31132]). BGEPA protections include provisions not included in the MBTA such as the protection of unoccupied nests and the definition of take that includes the prohibition of disturbing eagles.

In September 2009, the FWS finalized new regulations under the BGEPA to allow for the limited take of bald and golden eagles, or their nests, when the take is associated with otherwise lawful activities and the take would be compatible with the preservation of the bald eagle or the golden eagle (74 Federal Register 46835). The, final rule regarding take permits was published in the Federal Register on September 11, 2009 and outlines the types of permits, the permit application process, required monitoring, mitigations that may be required, and the application review process. Ruby is not anticipating the need for a take of bald or golden eagles and is not seeking seek a permit under these new regulations at this time.

Although eagle foraging habitat is not specifically protected under the BGEPA, activities that disturb (50 CFR 22.3) foraging eagles are prohibited by the BGEPA. Eagles are particularly sensitive to disturbance when nesting and roosting. Activities involved in the construction, operation, and maintenance of the Ruby project may have the potential to result in the take of eagles (*e.g.,* disturbance or killing).

The 1988 amendment to the Fish and Wildlife Conservation Act mandates that the FWS "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973." As a result of this mandate, the FWS created the Birds of Conservation Concern list (FWS, 2008b). The goal of the Birds of Conservation Concern list is to prevent or remove the need for additional ESA bird listings by implementing proactive management and conservation actions and coordinating consultations in accordance with Executive Order 13186.

Migratory raptor species in the project area are generally considered sensitive and in need of specialized protective measures. As such, FERC typically requires applicants to identify the location of raptor nests and commit to species-specific seasonal and/or spatial restrictions in order to minimize and avoid impacts on nesting raptors. Ruby reviewed numerous data sources and consulted with numerous resource agencies and conservation groups to obtain information on raptor species in the project area. Ruby conducted raptor surveys in 2008 within 0.5 mile of the outside edge of the proposed construction right-of-way along the entire pipeline route. Ruby conducted additional raptor surveys between April 15 and June 15, 2009, within 1 mile of all project areas. A summary of documented raptor nests is provided in table 4.5.5-1.

TABLE 4.5.5-1

Raptor Nests Identified Within 0.5 Mile of the Ruby Pipeline Project

State	Raptor Species	No. Observed Active Nests	No. Observed Inactive Nests
Wyoming	Burrowing Owl	-	-
	Golden Eagle	-	-
	Northern Harrier	1	-
	Red-Tailed Hawk	-	-
	Unknown Raptor[a]	-	6
Utah	American Kestrel	-	-
	Bald Eagle	-	-
	Burrowing Owl	1	-
	Ferruginous Hawk	-	-
	Golden Eagle	-	3
	Great Horned Owl	-	-
	Northern Harrier	-	-
	Prairie Falcon	-	-
	Red-Tailed Hawk	-	1
	Swainson's Hawk	-	-
	Unknown Raptor[a]	1	51
Nevada	American Kestrel	-	-
	Burrowing Owl	-	19
	Cooper's Hawk	-	-
	Ferruginous Hawk	-	-
	Golden Eagle	1	30
	Great Horned Owl	-	-
	Long-eared Owl	-	-
	Northern Harrier	-	-
	Prairie Falcon	-	-
	Red-tailed Hawk	1	6
	Short-eared Owl	-	-
	Swainson's Hawk	-	1
	Unknown Accipiter Species[a]	-	-
	Unknown Buteo Species[a]	-	-
	Unknown Owl[a]	-	1
	Unknown Raptor[a]	-	279
Oregon	Bald Eagle	-	-
	Great Horned Owl	-	-
	Northern Goshawk	-	-
	Osprey	-	-
	Prairie Falcon	-	-
	Red-Tailed Hawk	-	-
	Unknown Raptor[a]	-	11
California	Red-tailed Hawk	-	-
	Unknown Raptor[a]		1

a A nest is present but its location (*i.e.*, tree cavity or rock cliff/cavity) or lack of raptor present during the survey make identification impractical.

Ruby has committed to completing aerial surveys within 1 mile of the pipeline corridor for active raptor nests prior to commencement of project activities, as raptors may change nesting locations from year to year. These surveys would enable Ruby to identify specific areas where construction may affect active nests (and, in the case of burrowing owls, cause direct impacts on nests and nesting habitat) and where buffer zones may be required.

Ruby has stated it would adopt the seasonal and spatial restrictions outlined in the FWS's Utah Field Office *Guidelines for Raptor Protection from Human and Land Disturbances* (2002) (see table 4.5.5-2) , and would adhere to the most restrictive buffers of each state's guidelines and guidance. The FWS would consider any request from Ruby regarding modifications to seasonal or spatial requirements on a case-by-case basis. Any modifications would be based on biological information collected by qualified personnel. Ruby would not be authorized to begin or continue with construction within seasonal restricted timeframes or spatial buffers without site-specific approval by local FWS personnel. Any such change to its proposal would require Ruby to file a request for the review and written approval of the Director of OEP.

TABLE 4.5.5-2

General Seasonal Restrictions and Spatial Buffers for Raptors Along the Ruby Pipeline Project[a]

Species	Spatial Buffer (miles)	Seasonal Restriction
Bald eagle	1.0	January 1 – August 31
Golden eagle	0.75	January 1 – August 31
Northern goshawk	0.75	March 1 – August 15
Northern harrier	0.75	April 1 – August 15
Cooper's hawk	0.75	March 15 – August 31
Ferruginous hawk	1.0	March 1 – August 1
Red-tailed hawk	0.75	March 15 – August 15
Sharp-shinned hawk	0.75	March 15 – August 31
Swainson's hawk	0.75	March 1 – August 31
Turkey vulture	0.75	May 1 – August 15
Peregrine falcon	1.0	February 1 – August 31
Prairie falcon	0.75	April 1 – August 31
Merlin	0.75	April 1 – August 31
American kestrel	0.05 (300 feet)	April 1 – August 15
Osprey	0.75	April 1 – August 31
Boreal owl	0.75	February 1 – July 31
Burrowing owl	0.75	March 1 – August 31
Flammulated owl	0.75	April 1 – September 30
Great gray owl	0.25	March 1– June 30
Great horned owl	0.75	December 1 – September 31
Long-eared owl	0.75	February 1 – August 15
Northern saw-whet owl	0.75	March 1 – August 31
Short-eared owl	0.75	March 1 – August 1
Mexican Spotted owl	0.75	March 1 – August 31
Northern Pygmy owl	0.75	April 1 – August 1
Western Screech owl	0.75	March 1 – August 15
Barn-owl	0.25	February 1 – September 15

a Seasonal and spatial restrictions may change based on site-specific criteria provided the BLM and state agencies.

The FWS has recommended that Ruby and the FERC work closely with the appropriate FWS representative when blasting is proposed within 1 mile of an eagle nest and 0.5 mile within any other known raptor nests. Ruby may be required to develop a site-specific blasting plan to avoid take under the MBTA and/or the BGEPA. Avoidance or minimization measures that may be recommended by the FWS include delaying blasting activities, buffering or muffling the blasting area, or some other measure to ensure compliance with the MBTA and/or BGEPA.

The BLM has stated that certain spatial buffers outlined in various RMPs are different than those identified in table 4.5.5-2. For instance, the BLM's Kemmerer District stated it would restrict construction activities between February 1 and July 31 within 0.75 mile of active raptor nests. The BLM has indicated it is coordinating with Ruby to determine appropriate spatial and seasonal buffers on BLM-managed lands and would incorporate appropriate raptor protection measures into the POD and right-of-way grant. The BLM may consider modifications to seasonal or spatial guidelines on a case-by-case basis.

Ruby conducted breeding bird surveys within the 300-foot survey corridor centered on the proposed pipeline route in the spring and summer of 2008. The survey was conducted along the entire pipeline route and identified 79 nests and 135 fledged young within the survey corridor.

Ruby's construction schedule would overlap with the nesting season for many migratory bird species in the project area. Thus, construction could cause direct and indirect impacts on migratory birds. Indirect impacts could be associated with increased human presence and noise from construction activity that are close enough to disturb actively nesting birds. We do not believe that such impacts would be significant for non-nesting birds, as these individuals would temporarily relocate to avoid construction activities. However, construction activity near active nests during incubation or brood rearing could result in nest abandonment; overheating, chilling, or desiccation of unattended eggs or young causing nestling mortality; premature fledging; and ejection of eggs or young from the nest.

Ruby, in collaboration with the FWS, is preparing a Draft Conservation Agreement (Agreement) for the conservation of migratory bird species (Appendix M). The Agreement represents a voluntary, collaborative effort between Ruby and the FWS and is designed to include conservation measures that avoid and minimize potential adverse impacts on migratory birds and their habitats. The Agreement also provides a list of conservation options that the FWS and Ruby would consider as compensatory mitigation for loss of "habitat services" from the temporary and permanent loss of migratory bird habitat for development and operation of the project. The goal of this Agreement is to aid in the long-term conservation of migratory birds with active management of the species and the habitat upon which they depend.

Ruby proposes to enter into the Agreement in order to coordinate and collaborate with the agencies regarding the implementation of effective conservation measures for migratory birds and their habitats within and in the vicinity of its proposed right-of-way. These conservation measures are further outlined in Ruby's POD and provide additional conservation benefits that go beyond typical avoidance, minimization, and compensatory conservation measures. The decision for a company to enter into such a conservation measure agreement is voluntary but recommended by the FWS. Ruby has filed (and thus has committed to implementing) measures that (1) are technically and economically feasible; (2) would provide benefits to migratory birds within the project area (as defined in this final EIS); and (3) would avoid, minimize, or address direct and indirect impacts of the project on migratory birds and their habitat. Examples of conservation include: (1) avoidance and minimization measures; (2) implementation of timing and spatial buffers for raptors, including bald and golden eagles; (3) monitoring and post-construction activities; and (4) habitat conservation measures.

According to the BLM, a Habitat Equivalency Analysis approach was used to determine appropriate compensation ratios and acreages for the loss of migratory bird habitat resulting from direct, indirect, and residual project impacts. Habitat Equivalency Analyses quantify interim and permanent habitat injuries measured as a loss of habitat services from predisturbance conditions, and scaling compensatory habitat requirements to those injuries (King 1997; Dunford *et al*., 2004; Allen *et al.,* 2005; Kohler and Dodge, 2006; National Oceanic and Atmospheric Administration, 2006; 2009). Habitat services are generally defined by metrics that represent the functionality of that habitat (*i.e.,* the ability of that habitat to provide "services" such as nest sites, prey populations, and cover from predators).

Interim habitat injuries are those habitat services absent during disturbance and during vegetation restoration that would have been available if that disturbance had not occurred (direct, indirect, and residual impacts). Permanent habitat injuries are those habitat injuries remaining after vegetation recovery is complete (residual impacts). The objective of a Habitat Equivalency Analysis is to replace lost services with like services, providing replacement for the interim and permanent injury caused by the project. The Habitat Equivalency Analysis methodology employed for the Agreement and used in the analysis is provided in Appendix M.

According to the BLM, approximately 19,108 acres of migratory bird habitat would be directly impacted by pipeline construction activities. Of this, 1,485 acres (7.8 percent) would occur in Wyoming; 5,061 acres (26.5 percent) would occur in Utah; 10,042 acres (52.5 percent) would occur in Nevada; and 2,520 acres (13.2 percent) would occur in Oregon. Of the 19,108 acres of direct project impacts, 11,151 acres (58.4 percent) would occur in sagebrush steppe and associated ecosystems and are addressed as part of sections 4.7.3.1 and 4.7.3.3 because migratory birds associated with the sage-steppe ecosystem would benefit from conservation measures targeted toward greater sage-grouse and pygmy rabbits.

According to the BLM, the Habitat Equivalency Analysis quantified the compensation acreages necessary to mitigate and offset the direct impacts associated with the disturbance of the 7,957 acres not considered as part of the greater sage-grouse and pygmy rabbit conservation plan. It also considered the indirect impact on migratory bird habitat functionality that would occur as a result of noise and dust impacts on migratory bird habitats immediately adjacent to project construction areas, as well as the fragmentation of habitats that would result from pipeline and road construction. Residual impacts associated with permanent loss of migratory bird habitat and the 5- to 100-year duration of some vegetation restoration activities were also factors in the Habitat Equivalency Analysis for migratory birds. Results of the Habitat Equivalency Analysis indicate that 2,647 acres of migratory bird habitat of similar quality to that impacted would need to be purchased, enhanced, or created to offset the indirect and residual effects that would not be fully mitigated by vegetation restoration activities in areas disturbed by the project (table 4.5.5-3). More than 69 percent of the acreage would be necessary for replacement of the long-term loss of deciduous forest in Utah and coniferous forest in Oregon. The 2,647 acres would be in addition to the restored project right-of-way and associated temporary infrastructure (temporary access roads, storage yards, *etc.*).

We note that Executive Order 13186 requires federal agencies to avoid or minimize negative impacts on migratory bird populations. The Executive Order also requires federal agencies to identify where unintentional "take" is likely to have a measurable negative effect to migratory bird populations. Effects to non-special status bird species (which do not have significantly reduced populations) would not result in long-term or significant population level effect, given the stability of local populations and the abundance of available habitat outside the proposed right-of-way and the linear nature of the project over a large geographic range. The FWS has indicated that negative population-level impacts on bird species of conservation concern could occur from habitat removal and clearing during the critical nesting period; however, the FWS has not identified any specific species for which it believes a population-level impact could result from pipeline construction. The FWS has commented that the MBTA applies to all

migratory birds and nests. We believe that the project would not result in population-level impacts on migratory bird species, but acknowledge that pipeline construction during the migratory bird breeding season could impact individual birds and/or nests, and have a greater impact on birds of conservation concern due to their limited populations in the area. However, we also believe that Ruby's continuing coordination with the FWS to develop plans and procedures whereby pipeline construction could occur during the migratory bird nesting season, and especially development of the Migratory Bird Conservation Agreement, represents a good-faith effort to avoid or minimize impacts on migratory birds. Ruby, under encouragement from FERC, is fulfilling the responsibilities outlined in Executive Order 13186 by developing principles, standards, and practices that would lessen the amount of unintentional take, and is developing these conservation efforts in cooperation with the FWS.

TABLE 4.5.5-3

Acres Required by States to Compensate for the Direct, Indirect, and Residual Impacts on Migratory Bird Habitat Associated with Construction of the Ruby Pipeline Project[a]

Vegetation Type	State				
	Wyoming (acres)	Utah (acres)	Nevada (acres)	Oregon (acres)	**Total (acres)**
Agricultural and Developed	1.3	57.6	11.3	18.3	**88.4**
Conifer Forest	2.7	16.4	1.9	1344.4	**1365.4**
Deciduous Forest	1.7	465.1	66.6	34.1	**567.5**
Mixed Deciduous Conifer Forest	0.0	19.9	0.0	0.0	**19.9**
Pinyon-Juniper Woodland	0.4	193.4	164.9	246.8	**605.5**
Total	**6.1**	**752.3**	**244.7**	**1643.6**	**2646.6**

a This dara was provided by the BLM.

If the conservation plans in Appendix M are implemented, then direct, indirect, and residual impacts would be appropriately mitigated. To ensure that the necessary projects to fully offset impacts are funded, Ruby has committed dedicated funding for the purposes of completing migratory bird conservation measures identified in the migratory bird plan in Appendix M.

4.5.6 Special Wildlife Areas

The proposed project would cross or is in close proximity to a colonial wading bird nesting area near Goose Lake, Oregon (MPs R618 to R620). Ruby has adopted the Bud Garrett Marsh Rookery Route Variation to avoid the wading bird nesting area (see section 3.5.16). The ODFW has endorsed the variation, but has requested that no construction occur within 1,200 feet of the Bud Garrett marsh from May 1 to July 15. The route variation is located a minimum 1,200 feet from the marsh; therefore, a construction timing restriction is not required.

4.5.7 Wild Horses and Burros

The BLM and USFS protect, manage, and control wild horses and burros under the authority of the Wild Free-Roaming Horses and Burros Act of 1971 (WHBA) to ensure that healthy herds thrive on healthy rangelands. Under the WHBA, the BLM is required to manage wild horses and burros in those specific areas (herd areas) where they were found when the WHBA was passed in 1971. Some wild

horses and burros are also present on the Sheldon NWR; however, the WHBA does not apply on the Sheldon NWR. Instead, the Sheldon NWR manages resident feral horses and burros through its own horse and burro management program under the direction of the NWR System Administration Act. Through land use planning, the BLM also evaluates each herd area to determine if it has adequate food, water, cover, and space to sustain healthy and diverse wild horse and burro populations over the long-term. Herd areas which meet these criteria are then designated as Herd Management Areas (HMAs). The BLM also evaluates each HMA to determine how much forage is available for use. The available forage is then allocated among wildlife, wild horses and burros, and domestic livestock.

The BLM estimates that approximately 33,100 wild horses and 3,800 wild burros are roaming on BLM-managed rangelands in 10 western states, based on the latest data available (compiled as of February 28, 2009). The number of horses and burros that can graze without causing damage to the range is called the Appropriate Management Level (AML); the AML for the western states area is approximately 26,600 horses and burros (BLM, 2009a). The BLM has determined that the estimated current free-roaming population of wild horses and burros exceeds the AML that can exist in balance with other public rangeland resources and uses by about 10,300 animals.

To help bring herd populations into balance with rangeland conditions and the AML, the BLM gathers wild horses and burros from public rangelands each year and offers them for adoption or sale to individuals and groups willing and able to provide humane, long-term care. Further, the Secretary of the Interior recently announced a proposal for a new wild horse and burro management program whereby the BLM would establish new wild horse preserves across the nation, especially on the productive grasslands of the Midwest and East, and begin applying new strategies aimed at slowing population growth rates on Western public rangelands (BLM, 2009b).

Ruby's proposed route crosses five HMAs south and west of the Sheldon NWR in Humboldt and Washoe counties, Nevada. Table 4.5.7-1 lists the size of each of the HMAs crossed by the project and the associated AML (BLM, 2009a). Two of these HMAs, Black Rock Range West and Warm Springs Canyon, are in the BLM Winnemucca Field Office resource management area, while the Wall Canyon, Nut Mountain, and Massacre Lakes HMAs are in the BLM Surprise Field Office resource management area. The five HMAs crossed by the project comprise approximately 35 total miles of HMA land (BLM, 2009a).

TABLE 4.5.7-1

BLM Horse Management Areas Crossed by the Ruby Pipeline Project

HMA Name	Entire HMA Area (acres)	AML
Black Rock Range West	93,000	56 – 93
Warm Springs Canyon	83,000	119 – 199
Wall Canyon	42,000	15 – 25
Nut Mountain	40,500	30 – 55
Massacre Lakes	40,000	25 – 35
Total	**298,500**	**245 – 407**

While the proposed pipeline route crosses the southern portion of the Massacre Lake HMA, impacts on this herd are expected to be low as current census and distribution information indicates that the wild horses and burros typically do not use this portion of the HMA. The BLM has expressed concern regarding the impact of construction on restricting wild horse and burro access to important water

sources as water source access points are located north and south of the proposed route as it crosses the other four affected HMAs. Construction of the pipeline could affect wild horses and burros by restricting access to water sources; restricting movement within the HMA thereby reducing the availability of forage and sanctuary or the ability to escape areas of human disturbance; and displacing horses and burros, which could intensify their impacts on other areas.

The BLM would require, as part of its right-of-way grant, that Ruby implement mitigation techniques to ensure water supplies are available to wild horses and burros during construction. The BLM has identified four perennial, four intermittent, and one mechanical water source within 1.5 miles of the proposed pipeline route within the Winnemucca Field Office resource management area HMAs, and eight perennial water sources in the Surprise Field Office resource management area HMAs. Wild horses would be temporarily displaced by construction activities and they would have to move around and/or across the proposed construction areas to utilize these water sources. Water conditions vary seasonally and annually, but impacts on wild horse and burro access to water sources would likely be greatest during summer and fall months. Water may need to be hauled-in during the construction phase of the project to mitigate the project's effects to wild horses and burros, and water hauling sites would need to be predetermined so that water could be made available to the horses if the need arises.

Ruby has committed to installing soft plugs in the pipeline trench/crossovers (*i.e.,* gaps in the trench, spoil piles, and pre-welded pipe sections) every 0.5 mile or less when the route crosses agency-defined migration corridors and when water sources are present within 1,200 feet of the right-of-way. If pipeline construction comes within 0.25 mile of an existing water source or impedes access to a nearby water source, and if Ruby sees evidence that wild horses and burros are not crossing at installed soft plugs or crossovers, Ruby would locate temporary water supplies 0.5 mile outside of the construction area for wild horse and burro use. The BLM would require, as part of its right-of-way grant, that Ruby identify where supplemental water supplies may be necessary for wild horses and burros. Ruby also would be required to establish crossovers at well-defined trails, existing roadways, and other locations where the BLM expects wild horse and burro movement. Ruby would leave major horse trails across trenches intact as long as possible so as to minimize access impacts on forage areas and minimize loss of movement to habitat. Ruby also would install crossovers at existing fences within grazing allotments. These mitigation measures would minimize impacts on wild horses and burros.

The FWS has expressed concern that certain measures proposed by Ruby (*i.e.,* facilitation of horse and burro movement around construction areas, fence line manipulation, and opening of gates for construction activities) could result in additional wild horses or burros entering the Sheldon NWR. The FWS could then be required to increase its expenditures to manage the wild horse and burro populations, which could detract from the funds necessary to manage other NWR resources. Ruby has committed to coordinating with the Sheldon NWR to implement and maintain access restriction controls to prohibit the migration of wild horses and burros onto the Sheldon NWR. Ruby would coordinate with the FWS to repair or replace any cattle guards on the Sheldon NWR damaged by construction, and install new fencing, gates, or cattle guards at key areas. Finally, Ruby would erect fences to restrict animal movement out of the HMAs.

Construction of the pipeline could also affect wild horses and burros by creating safety hazards for the animals due to open trenches or vehicle collisions and increasing the likelihood of harassment. The BLM would require, as part of its right-of-way grant, that Ruby minimize the amount of time that the trench is open to decrease the potential for wild horse and burro entrapment, and also would install exit ramps every 0.5 mile in trenches within HMAs to facilitate escape for animals that enter the trench. Ruby also has stated that it would educate construction personal regarding the federal protection status of wild horses and burros and the penalties associated with their harassment. Ruby would post warning signs on access roads in areas known to have wild horses and burros to warn construction workers and to help

minimize the risk of accidental vehicle/animal collisions. Finally, the BLM would require that Ruby contact the BLM immediately should wild horses or burros be injured during project activities to determine a proper course of action for compliance with the WHBA.

As with livestock grazing impacts on restored construction areas, wild horses and burros could be attracted to the new plant growth in reclaimed areas, and their grazing could affect the seeding success and recovery of right-of-way vegetation. Ruby has committed to working with the BLM to limit wild horse and burro grazing along the reclaimed right-of-way for 3 years following construction by providing water sources away from the right-of-way, including low-palatable plant species (such as sagebrush) in the seed mix, placing temporary fencing, and/or reducing wild horse and burro populations in appropriate HMAs. Any efforts to reduce wild horse and burro populations would be done in consultation with the BLM and in accordance with BLM policies.

4.5.8 Non-Jurisdictional Electric Power Lines

Wildlife species present along the Rocky Mountain Power and Harney Electric Cooperative electric transmission and distribution line routes would be similar to those species found on the nearby pipeline route. Wildlife species moving through the area would be temporarily impacted by the noise and human activity associated with construction of the lines, and would disturbed and displaced for the duration of active construction. Some less mobile species occurring in the construction corridor could be directly impacted, and movements between habitat areas could be temporarily impeded due to noise and human presence. Additional temporary disturbances could occur during future maintenance activities along the lines. Wildlife impacts due to the proposed work would be temporary and minor.

Establishment of new electric power lines could increase impacts on birds as a result of electrocution and collision with wires and pylons. The FWS and BLM recommend that electric power lines be constructed in accordance with Edison Electric Institute's *Suggested Practices for Raptor Protection on Power Lines – The State of the Art* to minimize impacts on birds (Edison Electric Institute, 2006). Rocky Mountain Power is proposing to equip each pole with raptor anti-perching devices as well as conform to the standards as outlined in the *Suggested Practices* publication. We do not know if Harney Electric Cooperative is proposing to use anti-perching devices or to conform to the Edison Electric Institute's standards.

4.6 FISHERIES AND AQUATIC RESOURCES

4.6.1 General Fisheries and Aquatic Resources

The Ruby Pipeline Project would cross 167 different waterbodies that support fish species. Waterbodies known to contain fish species and their associated management classifications are presented in Appendix Q. A total of 83 waterbodies are known or suspected to contain federally or state-listed special status species. Special status species are discussed in section 4.7. The remaining waterbodies that would be crossed by the project are not expected to contain fish species but could support some aquatic invertebrates.

There are no surface waters within or immediately adjacent to the boundaries of aboveground facility sites or the Lakeview Temporary Housing Facility; thus, no fishery resources or other aquatic resources would be affected by the construction or operation of these facilities. An ephemeral stream is within the Vya Construction Camp site; however, it does not support aquatic resources.

Representative coldwater fish species that occupy waterbodies crossed by the proposed project include brook trout, brown trout, rainbow trout, cutthroat trout, redband trout, mountain whitefish, longnose dace, and speckled dace. Representative warmwater fish species include bass, walleye, perch, crappie, bullhead, green sunfish, suckers, chubs, carp, shiners, dace, tui chub, lamprey, and sculpin.

No waterbodies crossed by the project contain or have the potential to contain anadromous species or species managed by the National Marine Fisheries Service, nor do they support essential fish habitat as defined under the MSFCMA (Public Law 94-265 as amended through October 11, 1996). Therefore, no essential fish habitat would be affected by the proposed project.

Construction of the project could result in impacts on waterbodies and fisheries from sedimentation and turbidity, habitat alteration, stream bank erosion, fuel and chemical spills, water depletions, entrainment or entrapment due to water withdrawals or construction crossing operations, blasting, and operational pipeline failure. The extent of impact on aquatic resources from pipeline construction would depend on the waterbody crossing method, the existing conditions at each crossing location, the restoration procedures and mitigation measures employed, and the timing of construction. Impacts could either be short-term or long-term. Most short-term impacts would be associated with the immediate crossing activity itself (*e.g.,* trenching and laying of the pipe and substrate sediment being redeposited downstream) and would dissipate within a few days of the crossing being completed. Other short-term impacts could last from the initiation of construction up to 3 years after construction ends, as streambank restoration efforts become established. Long-term degradation of habitats could occur if stream contours are modified in the area of the crossing (effectively changing the flow patterns) and if erosion of the bed or banks introduces sediment that becomes deposited in the stream. However, with appropriate restoration and monitoring we do not expect long-term impacts on aquatic organisms.

4.6.1.1 Sediment and Turbidity

Pipeline construction through flowing waterbodies could increase sediment loads and downstream turbidity during construction. Open-cut construction (see section 2.3.2.2 for a discussion of waterbody crossing techniques) produces the highest downstream sediment loads of any standard construction technique (Mutrie and Scott, 1984; Reid and Anderson, 1999; Reid *et al.,* 2004). The amount of sediment produced by open cutting depends on multiple characteristics at the construction site including depth and width of the waterbody, current velocity and local turbulence at the site, concentrations of suspended sediment initially at the site and at some distance downstream, particle diameter, specific weight, and settling velocity of the excavated and backfilled materials (Reid *et al.,* 2004). However, an open-cut crossing is typically the quickest crossing method. Ruby would complete in-stream, open-cut construction activities within 24 hours for minor waterbodies (less than 10 feet wide) and within 48 hours for intermediate waterbodies (10 to 100 feet wide), except for blasting and other rock-breaking measures which would not be limited to these timeframes. Minimizing the time required for in-stream activities is a very important factor in reducing construction-related sedimentation and turbidity and overall in-water impacts.

Dry-ditch crossings, such as the dam-and-pump or flume methods, would be used at several stream crossings, especially those that contain special status species. Sedimentation and turbidity impacts associated with dry-ditch methods are generally limited to: 1) installation and removal of the upstream and downstream dams used to isolate the construction area; 2) water leaking through the upstream dam and collecting sediment as it flows across the work area and continues through the downstream dam; 3) movement of in-stream rocks and boulders to allow proper alignment and installation of the flume and dams; and 4) when streamflow is returned to the construction work area after the crossing is complete and the dams and flume are removed. Both dry-ditch crossing methods produce much less sediment in the water than a traditional "wet" open-cut method (Reid and Anderson, 1999; Reid *et al.,* 2002; Reid *et al.,*

2004). Dry methods have been reported to produce at least seven times less suspended sediment in streams than wet methods (Reid *et al.,* 2002).

Increased sediment loads associated with high turbidity can affect fish behavior and physiological processes such as blood chemistry, gill trauma, and immune system resistance, all of which can result in fish mortality. Sediment stirred into the water column can be redeposited on downstream substrates and could bury aquatic macro-invertebrates and other fish food sources. Additionally, downstream sedimentation could affect spawning habitat, spawning activities, eggs, larvae, and juvenile fish survival, as well as benthic community diversity and health. The duration of these effects would usually be relatively short as the effects of increased sedimentation and turbidity are often limited to the period of in-stream work. However, specific site characteristics including flow, substrate composition, relative disturbance, and other factors could make the duration of construction effects last longer. For example, rapid recolonization of benthic organisms has been documented within 30 days following pipeline construction (Gartman, 1984). Pipeline stream crossings in coldwater streams have documented a return to preconstruction conditions 2 to 4 years after construction (Blais and Simpson, 1997).

Ruby would minimize sedimentation and turbidity impacts on surface waters and aquatic resources by implementing the waterbody crossing and erosion and sediment control measures in its Procedures (Appendix G). Construction across waterbodies would be completed as quickly as possible to shorten the duration of sedimentation and turbidity. Ruby would stabilize the construction site, including the streambanks, immediately following installation of the pipeline. Ruby would also install and maintain sediment barriers (*e.g.,* silt fence, straw/hay bales) throughout construction to prevent sedimentation from surface run-off from entering waterbodies. Ruby would employ site stabilization measures in accordance with its Procedures and permit conditions in the event that circumstances required a construction delay.

4.6.1.2 Timing of Construction

The degree of impacts on aquatic resources associated with construction activities would depend on the timing and duration of in-water construction. Construction during periods of special status fish activity (*i.e.*, spawning, juvenile and adult rearing, and migration) could have a greater impact on fish than construction during other periods. Ruby would adhere to the in-water work windows in table 2.3.2-1 to minimize impacts on fish. Ruby has stated that some streams may need to be crossed outside of the referenced construction windows. Because the construction windows were intended to minimize effects of stream disturbance when the most sensitive fish life stages are present, the potential for adverse effects to these resources would increase if construction occurred outside the recommended windows. Ruby stated it would consult with appropriate state and federal resource agencies to obtain clear, written authorization should Ruby believe construction is necessary outside the established construction windows (see Appendix M, Draft Biological Resources Conservation Measures Plan). This is consistent with Ruby's Procedures and our guidance.

4.6.1.3 Vegetation Removal and Streambank Erosion

The clearing and grading of vegetation during construction could increase erosion along streambanks and increase turbidity levels in the waterbodies. Clearing and grading would adversely affect the beneficial functions and services of riparian and upland vegetation, especially to riparian and aquatic species. The degree of impact on aquatic organisms from erosion would depend on sediment loads, stream velocity, turbulence, streambank composition, and sediment particle size. Long-term degradation of habitats could occur if the stream contours are modified in the area of the crossing, the flow patterns are changed, or if erosion of the bed, banks, or adjacent upland areas introduces sediment into the waterbody beyond the temporary short-term construction stabilization period. Loss of riparian vegetation along the banks would reduce shade (potentially increasing water temperatures), remove an

important source of terrestrial food for aquatic organisms, and decrease existing root stock used to stabilize waterbody banks. Additionally, the removal of boulders, woody debris, streambank vegetation, and undercut banks could temporarily displace fish that utilize these features for cover, nesting, and feeding.

Where necessary, Ruby would grade an approach across the entire construction workspace at intermittent and dry waterbodies to the flow line of the stream where steep or cut banks exist. Ruby would grade a 50- to 60-foot-wide approach on the working side of the construction workspace at perennial waterbodies to the flow line of the stream where steep or cut banks exist. Ruby would then install temporary equipment bridges, mats, and pads across waterbodies less than 25 feet wide to support equipment that must cross the waterbody. Ruby also would limit construction equipment working in waterbodies greater than 25 feet wide that do not contain special status species as specified in its Procedures.

Ruby would cut most trees near the bank at ground level to aid in maintaining bank stability, except those trees in the trench line. Roots would be removed over the trench line or from any steam banks that would need to be cut down or graded to accomplish the pipeline crossing.

Ruby would install sediment barriers, such as silt fence and straw/hay bales, across the right-of-way at the edge of waterbodies throughout construction except for short periods when the removal of these sediment barriers is necessary to dig the trench, install the pipe, pass vehicles, and/or restore the right-of-way. Ruby would locate temporary extra workspaces at least 50 feet from the edge of flowing waterbodies, except where a site-specific variance has been granted, and would limit clearing of vegetation between temporary extra workspaces and the edge of the waterbody to the construction right-of-way. We have recommended in section 4.4.3 that Ruby limit its right-of-way width to 75 feet; replant woody riparian vegetation; and monitor the success of restored woody riparian habitats for a minimum of 5 years. Ruby would immediately stabilize the construction site, including stream banks, following completion of construction. If circumstances required a construction delay Ruby would employ site stabilization measures in accordance with its Procedures and other permit conditions. A detailed description of Ruby's proposed waterbody mitigation is provided in section 4.3.2.4. Ruby would be required to monitor and restore all disturbed areas until restoration and revegetation is deemed successful.

4.6.1.4 Contaminated Sediment Resuspension

As indicated in table 4.3.2-5 in section 4.3.2.1, Twelvemile Creek, Twentymile Creek, and Thomas Creek could have the potential to contain contaminated sediments. Ruby has proposed to use a dry-ditch crossing method in these three waterbodies to limit in-stream activity and therefore minimize resuspension of any potentially contaminated sediment. Ruby states it would stockpile excavated material in adjacent upland extra workspace, install erosion control devices to minimize or eliminate spoil from entering the waterbodies, and return the streambed profiles to preconstruction conditions. Ruby would incorporate any special COE or state conditions and adhere to all permit stipulations when handling potentially contaminated sediments.

4.6.1.5 Entrainment and Entrapment

Dry-ditch crossing methods that involve a dam and pump may result in some fish being trapped between the upstream and downstream dams of the waterbody crossing. Ruby states it would utilize an experienced biologist qualified in fish capture and release techniques to relocate any fish trapped within the isolated work area along the entire project. Ruby would contact the ODFW at least 48 hours prior to stream crossing construction in Oregon to allow the ODFW to conduct fish salvage operations at

waterbody crossings in Oregon. Ruby has stated it would submit fish passage plans to the ODFW for review and approval.

Some small fish, larvae, and fish eggs could be entrained by water pumps during the dam-and-pump process or during water withdrawals for hydrostatic testing and dust control. Larger fish should be able to avoid entrainment and would likely avoid the project area during these activities. Ruby would minimize these potential effects by adhering to measures in its Procedures (Appendix F) and Hydrostatic Test Plan (Appendix K). These plans include screening criteria for intake hoses, details on locating pump intakes to minimize entrainment, and regulation of the pumping rate to avoid adverse impacts on aquatic resources or downstream flows. Ruby would acquire the necessary permits and approvals from state and federal agencies before withdrawing hydrostatic test water. Impacts would further be minimized by adhering to in-water work windows when few fish and larvae would be present.

Ruby states that it would comply with fish screening criteria established by the ODFW and that 0.25-inch fish screens would be used on pump intakes. However, the ODFW has commented that this screen size is not consistent with ODFW screening criteria. Ruby would be required to coordinate with the ODFW to ensure that its proposed fish screening plan complies with ODFW requirements.

4.6.1.6 Water Temperature

Vegetation cover that provides shade, especially during summer, is one factor that regulates stream temperatures (WDNR, 1997). Construction across waterbodies would necessitate removal of trees and riparian shrubs at the crossing locations. Review of available information on the effects of pipeline construction in other regions to water temperature reveals that pipeline construction activities would result in little to no measurable change in water temperature. The total width of riparian area affected by shade tree removal would be small (approximately 75 feet) relative to the length of any stream crossed. In one study, construction across two coldwater, fish-bearing streams in Alberta required removal of forested riparian vegetation. Water temperatures at construction sites and downstream did not increase above temperatures at control sites upstream from construction (Brown *et al.,* 2002). Similarly, water temperatures measured at four coldwater streams in New York before and during pipeline construction and for 3 years following construction showed no short-term or long-term effects to water quality parameters, including water temperature, even though streambank vegetation was cleared (Blais and Simpson, 1997).

The studies by Brown, *et al.,* and Blais and Simpson, even if not conducted in the Pacific Northwest, have determined that no measurable change in water temperature is observed as a result of construction activities. We also discuss how operation of the pipeline could potentially impact stream temperatures in section 4.3.2.4, and conclude that the amount of heat transfer from the pipeline to a surface water would be minimal and would not noticeably increase water temperatures. We conclude that any changes in water temperature related to vegetation clearing and operation of the pipeline at waterbody crossings are likely very small and undetectable, and would not have an ecological impact.

4.6.1.7 Blasting Impacts on Fisheries and Aquatic Resources

Explosives detonated near water produce shock waves that can be lethal to fish, eggs, larvae, and other aquatic species by rupturing swim bladders and addling egg sacs (British Columbia Ministry of Transportation, 2000). Shock waves propagated from ground to water are less lethal to fish than in-water explosions as some energy is reflected or lost at the ground-water interface (Alaska Department of Fish and Game, 1991).

As stated in section 4.1.1.1, blasting may occur at certain locations between MP 57.5 and the terminus of the project near Malin, Oregon. Several waterbodies along that portion of the pipeline route have the potential to support special status fish species (see Appendix Q). The best way to reduce or eliminate blasting effects to fish when blasting is required is to keep fish out of regions where pressure waves could be harmful. Several techniques have been implemented during similar pipeline construction projects to remove fish from the construction area or reduce the effect of blasting on fish, including strobe lighting, low frequency sound (*e.g.,* pneumatic propellers), fishpulsers, scare charges, and bubble curtains. Proper use of these techniques could significantly reduce the number of fish in the blasting area. We recommended in the draft EIS that Ruby implement one or more of these practices before blasting in a waterbody with special status fish. The FWS subsequently indicated that some of these practices (*e.g.*, scare charges and bubble curtains) could harm or harass fish and result in a violation of the ESA or other laws designed to protect special status fish species. Therefore, **we recommend that Ruby coordinate with the FWS, NDOW, and ODFW to determine if and how fish deterrence practices would be implemented before blasting takes place in any waterbody that has the potential to contain special status fish species as identified in section 4.7 of this EIS. Ruby should file the results of its consultations with these agencies prior to crossing the affected waterbody.**

4.6.1.8 Hydrostatic Testing and Water Withdrawals

Ruby indicated it would require about 28,988,784 gallons (89 acre-feet) of surface water for dust control and hydrostatic testing of the pipeline, and may use up to 51,506,417 gallons (158 acre-feet), pending approval from the Bear River Canal Company (see section 4.3.2.5). The appropriation of surface waters could impact aquatic resources if the diversions constitute a large percentage of the river's total flow or volume. These impacts could include the temporary loss of habitat, changes in water temperature and dissolved oxygen levels, and entrainment or impingement of fish or other aquatic organisms. The discharge of large volumes of hydrostatic test water could result in a change in water temperature and dissolved oxygen levels, cause an increase in downstream flows, and contribute to streambank and substrate scour. Several commenters have also expressed concern that discharging hydrostatic test water to different water basins could potentially transfer nuisance exotic organisms between basins. The transfer of water between water basins is discussed in section 4.6.2.

The potential effects of water withdrawals would be minimized by adhering to the measures in Ruby's Procedures and Hydrostatic Test Plan. These measures include: screening intake hoses to prevent the entrainment of fish and other aquatic organisms as previously discussed; positioning water intakes in the upper level of the water column to minimize entrainment of fish, larvae, and eggs; placing water pumps in containment devices to minimize the potential for fuel spills or leaks; and limiting water withdrawals to rates less than 2,500 gpm and rates that would be less than 10 percent of a river's flow at the time of water withdrawal (see section 4.3.2.5).

The Hams Fork River is the only hydrostatic test water source known to contain special status species. The FWS has stated that water withdrawals (depletions) from the Hams Fork River, which is located within the Colorado River system, may adversely affect the bonytail chub, Colorado pikeminnow, razorback sucker, and humpback chub. Impacts on these species and other federally listed species, including potential depletion impacts, are discussed in section 4.7.

All surface water used for hydrostatic testing would be discharged within the same 8-digit HUC watershed from which it was withdrawn. This would prevent the inadvertent transfer of pathogens or NAS between watersheds. Ruby would use industry-accepted and agency-approved biocides to appropriately treat test water for pathogens and NAS if the source water is known to contain pathogens or NAS and the discharge has the potential to reach other surface waters not known to contain similar pathogens or NAS (see section 4.3.2.5). Ruby would discharge the test water to upland areas and

sediment filtration/energy dissipation devices as described in section 4.3.2.5. No impacts on aquatic resources are anticipated from the discharge of hydrostatic test waters.

4.6.1.9 Fuel and Chemical Spills

Any large construction project presents the potential for spills of fuel or other hazardous liquids from storage containers, equipment working in or near streams, and fuel transfers. Any spill of fuel or other hazardous liquid that reaches a waterbody would be detrimental to water quality. The chemicals released during spills could have acute, direct effects to fish, or could have indirect effects such as altered behavior, changes in physiological processes, or changes in food sources. Fish also could be killed if a large volume of hazardous liquid is spilled into a waterbody. Ingestion of large numbers of contaminated fish could affect primary and secondary fish predators in the food chain.

Ruby would implement its Spill Plan (Appendix J) to minimize impacts related to spills. The Spill Plan specifies preventive measures such as personnel training, equipment inspection, and refueling procedures to reduce the likelihood of spills, as well as mitigation measures such as containment and cleanup to minimize potential impacts should a spill occur. Adherence to the Spill Plan would prevent a large spill from occurring near surface waters because construction equipment fueling would be prohibited within 100 feet of the waterbody banks, and hazardous material storage would be prohibited within 100 feet of waterbodies. Ruby has agreed to a 500-foot setback where required by the BLM on federal lands. The BLM has indicated that it would require a 500-foot setback at most waterbodies on BLM-managed lands. If a small spill were to occur, adherence to measures in the Spill Plan would decrease the response time for control and cleanup, thus avoiding or minimizing the effects of a spill on aquatic resources. Training and lines of communication to facilitate the prevention, response, containment, and cleanup of spills during construction activities also are described in the Spill Plan. Ruby's implementation of its Spill Plan would minimize the potential for and the impact of any spill near surface water on aquatic resources.

4.6.1.10 Pipeline Rupture

The pipeline would be designed, installed, tested, and maintained such that the chance of a pipeline rupture would be extremely remote (see section 4.12). However, if a pipeline rupture were to occur beneath a waterbody crossing, natural gas would percolate through the soil and sediments underlying the stream, rise through the water column of the stream, and rapidly dissipate into the atmosphere. The potential outcome would depend on the volume of natural gas released and whether an ignition source is available. A pipeline break could result in soil, sediment, and debris being thrown from the area of the break, destruction of streambank vegetation, and, in the case of ignition, explosion, or fire potentially resulting in a severe impact on nearby fisheries and habitat. For a less severe release, natural gas would displace oxygen within the interstitial water of the sediments, resulting in temporary hypoxia within the sediments. As natural gas ascended through the water column, it would displace oxygen, possibly producing hypoxic conditions in the immediate vicinity of the release and for some distance downstream. Fish in the vicinity of a natural gas release could be impacted by temporary hypoxia. Considering the narrow width of the majority of the waterbodies that would be crossed and their relatively shallow depth, most of the natural gas would be rapidly released to the atmosphere, and any change in water chemistry or quality would be minor. Because fish are mobile, most would have the ability to avoid or leave the areas with unfavorable environmental conditions resulting from such a release. We believe the chance for a pipeline rupture to affect aquatic resources is extremely remote.

4.6.2 Aquatic Pathogens and Nonnative Aquatic Species

The project would have the potential to spread invasive aquatic organisms, such as the New Zealand mud snail, whirling disease, European ear snail, Quagga mussels, and Zebra mussels. Such species degrade aquatic ecosystem functions and in some cases completely alter aquatic systems by displacing native species, degrading water quality, altering trophic dynamics, and restricting beneficial uses.

The New Zealand mud snail was identified in the Little Bear River near the project area in 2001 and 2002.[4] These snails invade aquatic systems by attaching themselves to boots, waders, sandals, fishing gear, boats, rafts, and earth-moving equipment. New Zealand mud snails are nearly impossible to eradicate or contain once they have invaded an aquatic ecosystem. The snails can survive for several days out of water and can withstand a wide range of temperatures. These snails have been known to pass unscathed through the digestive tracts of fish. The snails are self-reproducers that give birth to well-developed clones. Therefore, it only takes one New Zealand mud snail to start a new colony in a stream or river.

Ruby proposes to implement disinfection measures for vehicles, construction equipment, hand tools, boots, and other equipment used in waterbodies or permanently inundated wetlands to minimize the spread of the New Zealand mud snail, as deemed appropriate by a suitable qualified EI. The disinfection measures proposed by Ruby (which are included in the recommendation below) are standard disinfection measures recommended by agencies such as the Utah Department of Agriculture and Food, the Colorado Division of Wildlife, and the USDA. We find these disinfection measures generally acceptable; however, Ruby only proposed these for control of the New Zealand mud snail. In addition, we believe these measures should not be used solely at the discretion of an EI, and therefore **we recommend that Ruby implement an equipment disinfection plan to incorporate one or more of the following measures during construction as equipment enters and exits each of the 25 HUC watersheds crossed by the project, as equipment exits the Little Bear River, and as equipment exits waterbodies known to contain pathogens and nonnative aquatic species that can be spread by contact with construction equipment. Ruby should remove mud and debris from equipment and either:**

- **a. keep the equipment dry for at least 10 days prior to use;**
- **b. spray or soak the equipment with 1) a 10-percent chlorine bleach solution, 2) a 1:1 solution of Formula 409 household cleaner, or 3) a 1:15 solution of Sparquat 256 institutional cleaner, making sure to keep the equipment moist with the cleaner for at least 10 minutes; or**
- **c. spray or soak the equipment with steam or water greater than 130 °F for at least 10 minutes.**

Additionally, if Ruby identifies <u>any</u> invasive water organism on any equipment as it leaves a waterbody or wetland, Ruby should report the sighting to the appropriate state conservation office and implement disinfection measures on all equipment as it leaves the infected waterbody or wetland.

The UTPL has requested that only hot water (greater than 140 °F) and drying be used to disinfect equipment before it leaves a waterbody. We do not believe this is necessary at every waterbody crossed

[4] Current sightings and distribution of the New Zealand mud snail can be found at: http://nas.er.usgs.gov/taxgroup/mollusks/newzealandmudsnaildistribution.asp.

by the project in Utah. Our recommendation above, if diligently implemented, would avoid or limit the spread of pathogens and NAS during project construction.

During the comment period of the draft EIS, we requested that stakeholders identify and provide documentation of any known populations of aquatic nuisance species that could be encountered along the project. No specific locations were identified during the comment period. If any known locations are identified prior to and during construction, Ruby would disinfect equipment where these species are identified in accordance with our recommendation above.

4.6.3 Non-Jurisdictional Electric Power Lines

No streams exist within the proposed Rocky Mountain Power project area, and only one ephemeral waterbody would be crossed by the Harney Electric Cooperative electric distribution line. The ephemeral waterbody is narrow enough that it could be spanned with normal spacing of the power line poles. Therefore, there would be no direct impacts on the waterbody. Indirect impacts, however, could occur as a result of vegetation clearing and surface grading to access and construct the line. Stormwater runoff could result in increased turbidity and localized sedimentation of the stream. Harney Electric Cooperative would install erosion control devices during construction to prevent or minimize sediment runoff. These impacts, therefore, would be expected to be temporary and minor.

4.7 SPECIAL STATUS SPECIES

Special status species are those species for which state or federal agencies afford an additional level of protection by law, regulation, or policy. Included in this category are species federally listed as endangered or threatened, are considered as candidates for such listing by the FWS, or are petitioned for listing under the ESA; species managed by the BLM or USFS to prevent listing under the ESA; and those species that are state-listed as threatened or endangered or designated as a state species of concern.

In accordance with Section 7 of the ESA, the lead federal agency (in this case, the FERC) in coordination with the FWS must ensure that any action authorized, funded, or carried out by the agency does not jeopardize the continued existence of a federally listed threatened or endangered species or result in the adverse modification of the designated critical habitat of a federally listed species. The lead federal agency also must prepare a BA for actions involving major construction activities with the potential to affect listed species or designated critical habitat. The lead agency must submit its BA to the FWS and, if it is determined that the action is likely to adversely affect a listed species, the lead federal agency must submit a request for formal consultation to comply with Section 7 of the ESA. The FWS would then issue a Biological Opinion as to whether or not the federal action would likely jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. We have determined that the Ruby Pipeline Project could affect federally listed species and their designated critical habitats. Therefore, we are submitting a BA under separate cover to the FWS for the project. The analysis in this EIS and the BA would also be used by other federal cooperating agencies, as applicable, to fulfill their permitting requirements. Federally listed species that may be affected are presented in table 4.7-1 and discussed individually in section 4.7.2.

The project would cross FWS Regions 1, 6, and 8. The FWS typically designates a lead office for project review and ESA consultation in the case of a multiregional project such as the Ruby Pipeline Project. The FWS's Denver Resource Office would coordinate NEPA review for the project and the FWS's Oregon Field Office in Portland, Oregon would coordinate the Section 7 review for the project.

Although candidate and petitioned species do not receive federal protection through the ESA, the FWS specifically requested that the FERC consider the potential effects to certain candidate and petitioned species in the EIS so that Section 7 consultation could be facilitated in the event one or more of these species become listed before or during project construction. There is suitable habitat within the project area for two candidate species (the yellow-billed cuckoo and Columbia spotted frog) and five petitioned species (the greater sage-grouse, pygmy rabbit, white-tailed prairie dog, northern leatherside chub, and the northern leopard frog). Federal candidate species and those petitioned for federal listing that may be affected are presented in table 4.7-1 and discussed individually in section 4.7.3 of this EIS.

Land managing agencies are charged with managing lands to prevent species listing under the ESA. Each BLM Field Office and USFS National Forest designates species for extra management efforts intended to meet the conservation needs of these species and maintain viable populations (USFS, 1995; BLM, 2001; USFS 2004). However, within Nevada, the BLM state office designates the sensitive species list. Oregon is the only affected state that provides regulatory protection for state-listed species. BLM-listed, USFS-listed, and state-listed species that may be affected are presented in Appendix U and further discussed in section 4.7.4 by habitat association.

Our analysis of special status species focuses on 421 species that are known to occur in the project area (Appendix U). This list of species was developed by Ruby through informal consultation with, and technical assistance from, the FWS, BLM, USFS, and state resource management agencies and by comments on the draft EIS. Our evaluation determined that 189 species are highly unlikely to occur in the project area or would otherwise not be affected by project activities. Thus, the project *would not affect* these 189 species. Our comments for federally listed species that would not be affected by the project and have been removed from further consideration in this EIS are included, among others, in table 4.7-1. We provide our comments for BLM and USFS sensitive species and state-listed species that would not be affected by the project and have been removed from further consideration in this EIS in Appendix U.

4.7.1 General Measures to Minimize Impacts on Special Status Species

Ruby has proposed several measures to minimize impacts on special status species and their habitats. We have summarized these primary measures to provide a context for our discussion of impacts. Our discussion below includes recommendations and measures we believe are necessary to prevent 1) adverse impact on a federally listed species; 2) adverse modification to designated critical habitat; 3) loss of viability for BLM-, USFS-, or state-listed species; 4) or actions that are contrary to an agency's conservation needs.

TABLE 4.7-1

Federal Threatened, Endangered, Candidate, and Petitioned Species for the Ruby Pipeline Project

Species	FWS and Federal Land Managing Agency Status[a]											
	FWS Status	BLM Field Offices						Forest Service			State Status[b]	Comments
		KFO	SLFO	EFO	WFO	SFO	LFO	KFO	FNF	CNF		
BIRDS												
Greater sage-grouse (*Centrocercus urophasianus*)	Pet	S	S	S	S	S	S	S	S	S	WGFD-SC UDWR-SC ODFW-S	Suitable habitat consists of mid- to low-height sagebrush. The project would cross potential lekking, nesting/brood-rearing and winter habitat in Wyoming, Utah, and Nevada.
Northern spotted owl (*Strix occidentalis caurina)*	T											Prefers old growth mixed-conifer forests. Nests in broken tree tops, cliff ledges, tree cavities, and abandoned hawk nests. Potential habitat is not present near the project, and the project is outside of the species' known range. This species has been eliminated from further consideration.
Yellow-billed cuckoo (Western Distinct Population Segment) (*Coccyzus americanus)*	C	S	S	S	S	S	S				WGFD-SC UDWR-SC NDOW-SP	Breeds in riparian woodlands and shrubs with dense subcanopy. The project would cross potential breeding habitat in Wyoming and Utah.
MAMMALS												
Black-footed ferret (*Mustela nigripes)*	E	S									WGFD-NSS1	Suitable habitat consists of black-tailed and white-tailed prairie dog towns composed of short- to mid- grass prairies, and semi-desert areas with grass and shrubs intermingled. The project would cross potential habitat within large prairie dog colonies in Wyoming and Utah.
Canada lynx (*Lynx canadensis)*	T	S	S							S	UDWR-SC WGFD-NSS1	Suitable habitat consists of boreal and montane regions made up of coniferous or mixed forests with thick undergrowth at 3,500 to 7,000 feet. The project would cross a travel corridor and potential secondary habitat in the Cache National Forest. However, agency data and personnel indicate that lynx are not known to occur in the project area. A chance encounter by project activities, though unlikely, would not result in any noticeable effects to the Canada lynx. This species has been eliminated from further consideration.
Fisher (*Martes pennanti)*	C							S	S	S		Inhabits coniferous and mixed forests, including early successional forests with dense overhead cover. The project is outside of the species' known range. This species has been eliminated from further consideration.
Gray wolf (*Canis lupis)*	E WY-EXPN[c]											Occupies a wide range of habitat dependent upon the presence of the species' primary prey (big game). The project crosses potential habitat in the Cache National Forest and Fremont National Forest. However, the species is not known to occur in either area. The gray wolf is a wide- ranging species. There is a low possibility that gray wolves could occur in the project area; however, because construction windows would be planned outside big game winter range and migration periods, the project would have no effect to gray wolves. A chance encounter by project activities, though unlikely, would not result in any noticeable effects to the gray wolf. This species has been eliminated from further consideration.

TABLE 4.7-1

Federal Threatened, Endangered, Candidate, and Petitioned Species for the Ruby Pipeline Project

Species	FWS and Federal Land Managing Agency Status[a]											Comments
	FWS Status	BLM Field Offices							Forest Service		State Status[b]	
		KFO	SLFO	EFO	WFO	SFO	LFO	KFO	FNF	CNF		
Pygmy rabbit (*Brachylagus idahoensis)*	Pet	S	S	S	S	S	S	S	S	S	WGFD-SC UDWR-SC ODFW-S	Suitable habitat consists of dense stands of big sagebrush in alluvial fans and terraces where relatively deep soils allow burrowing. The project would cross known occupied habitat in Wyoming, Utah, and Nevada.
White-tailed Prairie dog (*Cynomys leucrurus*)	Pet	S	S								WGFD-SC	Suitable habitat consists of dry, flat, open grasslands with low or relatively sparse vegetation. The project would cross known occupied habitat in Wyoming and Utah. White-tailed prairie dogs were observed between MPs 2 to 5.5, MPs 20 to 25, MPs 48 to 49, and near MP 54.
Wyoming pocket gopher (*Thomomys clusius*)	Pet	S										Known from Sweetwater and Carbon counties, Wyoming. Suitable habitat consists of well-drained soils on gravelly ridges. The closest known location is about 30 miles east of the project. Predictive distribution models conducted by the Wyoming Natural Diversity Database, University of Wyoming, suggest that the closest suitable habitat is at least 30 miles southeast of the proposed project. Thus, the project is outside of the species' known and modeled range, and <u>this species has been eliminated from further consideration.</u>
FISH												
Bonytail chub (*Gila elegans)*	E	S										Known in the Colorado River and limited larger tributaries. Inhabits deep water of mid to large rivers and reservoirs. Found in isolated populations in the Yampa River, Green River, Colorado River at the Colorado/Utah border, confluence of the Green and Colorado Rivers, and in Lake Mohave in Arizona. This species has not existed in the Green River drainage of Wyoming since the closure of Flaming Gorge Dam in 1964. Upper Colorado River System water withdrawals may affect this species.
Bull trout (*Salvelinus confluentus)*	T											Found in deep water of cold rivers and streams, and large coldwater lakes and reservoirs in the Jarbidge River, Nevada, whose headwaters would be located 25 miles north of the project area. May possibly occur in Lake County, Oregon. However, an ODFW 1997 report (*Status of Oregon's Bull Trout*) did not list any historic or current presence of bull trout within any Oregon portion of the project area, including Lake County. <u>This species has been eliminated from further consideration.</u>
Clover Valley speckled dace (*Rhinichthys osculus oligoporus)*	E											Restricted to reservoirs and outflows of three spring systems in Clover Valley in Elko County, Nevada. Habitats vary from cold streams and rivers to small thermal springs. The project is outside of the species' known range. <u>This species has been eliminated from further consideration.</u>
Colorado pikeminnow (*Ptychocheilus lucius)*	E	S										Restricted to the Upper Colorado River basin, with populations in the Green River and Little Snake River systems in Wyoming. Inhabits deep areas of medium to large rivers that maintain high spring flows. Upper Colorado River System water withdrawals may affect this species.

TABLE 4.7-1

Federal Threatened, Endangered, Candidate, and Petitioned Species for the Ruby Pipeline Project

Species	FWS and Federal Land Managing Agency Status[a]										Comments
	FWS Status	BLM Field Offices							Forest Service		State Status[b]	
		KFO	SLFO	EFO	WFO	SFO	LFO	KFO	FNF	CNF		
Cui-ui (*Chasmistes cujus*)	E										NDOW-SP	Endemic to Pyramid Lake, Nevada and spawns in Truckee River in early April through mid-May. The project is outside of the species' known range. This species has been eliminated from further consideration.
Desert dace (*Eremichthys acros*)	T				S						NDOW-T	Restricted to thermal springs and their associated outflows in Soldier Meadows in Humboldt County, Nevada. The project is outside of the species' known range. This species has been eliminated from further consideration.
Foskett speckled dace (*Rhinichthys osculus ssp.*)	T										ODFW-S	Known in Foskett Spring in Lake County, Oregon. Inhabits shallow waters with grass overhangs. This isolated spring is 100 meters long and subsides into dry Coleman Lake. The project is outside of the species' known range. This species has been eliminated from further consideration.
Humpback chub (*Gila cypha*)	E	S										Known sparingly in the Colorado River system. Inhabits deep, turbid water of rivers. This species has not existed in the Green River drainage of Wyoming since the closure of Flaming Gorge Dam in 1964. Upper Colorado River System water withdrawals may affect this species.
Hutton tui chub (*Gila bicolor ssp.*)	T											Restricted to Hutton Spring in Lake County, Oregon. Inhabits deep springs ranging from 20 to 40 feet in width, and about 15 feet in depth at the center, surrounded by herbaceous cover. The project is outside of the species' known range. This species has been eliminated from further consideration.
Independence Valley speckled dace (*Rhinichthys osculus lethoporus*)	E			S							NDOW-E	Restricted to Independence Valley in Elko County, Nevada. Habitats vary from cold streams and rivers to small thermal springs. The project is outside of the species' known range. This species has been eliminated from further consideration.
June sucker (*Chasmistes liorus*)	E		S								UDWR-S	Endemic to Utah Lake, migrates to Provo River for spawning. Introduced populations have been established in parts of Utah. The project is outside of the species' known range. This species has been eliminated from further consideration.
Lahontan cutthroat trout (introduced, refugia population) (*Oncorhynchus clarkii henshawii*)	T		S	S	S						NDOW-SP UDWR-S	Inhabits cool, well-oxygenated waters of saline and alkaline lakes and streams. The project would cross known habitat in Elko and Humboldt counties, Nevada; potential, but unlikely, habitat in Box Elder County, Utah; and a number of dry and intermittent streams that pass near downstream waterbodies with known populations.
Least chub (*Lotichthys phlegethontis*)	Pet		S								UDWR-S	Inhabits springs and streams in western Utah, including Snake Valley, Mona Springs, Mills Valley, and Clear Lake. The project is outside of the species' known range. This species has been eliminated from further consideration.

TABLE 4.7-1

Federal Threatened, Endangered, Candidate, and Petitioned Species for the Ruby Pipeline Project

Species	FWS and Federal Land Managing Agency Status[a]										State Status[b]	Comments
	FWS Status	BLM Field Offices						Forest Service				
		KFO	SLFO	EFO	WFO	SFO	LFO	KFO	FNF	CNF		
Lost River sucker (*Deltistes luxatus)*	E										ODFW-S	Inhabits lakes in the Upper Klamath Basin. Spawns from March through May in springs and tributary streams over gravel or cobble. The project would cross proposed critical habitat within the Clear Lake watershed, and crosses potential habitat at the Lost River crossing in Klamath County, Oregon and at the South Arm of and North Fork of Willow Creek in Lake County, Oregon.
Modoc sucker (*Catostomus microps)*	E										ODFW-S	Known in the Pit River system in Modoc and Lassen Counties, California and the Goose Lake basin in Oregon. Inhabits intermittent headwater streams flowing through meadows and dry forests between 4,219 and 5,141 feet above mean sea level. The project would cross potential habitat at Thomas Creek in Lake County, Oregon. The FWS has indicated that Twentymile Creek and Twelvemile Creek may provide habitat, although the species' presence there has not been established.
Northern leatherside chub (*Lepidomeda copei)*	Pet	S	S								WGFD-SC	Inhabits rocky, flowing pools and low-velocity runs of creeks and small- to medium-sized rivers. The project would intermittently cross potential habitat at Salt Creek in Uinta County, Wyoming at approximate MP 42 and at Bear River and its tributaries in Uinta County, Utah between MPs 20 to 25 and MPs 45 to 70.
Razorback sucker (*Xyrauchen texanus)*	E	S										Known in the Colorado River system. Inhabits large, clear to turbid rivers. This species has not existed in the Green River drainage of Wyoming since the closure of Flaming Gorge Dam in 1964; remnant populations exist in the Green River basin south of the project area. Upper Colorado River System water withdrawals may affect this species.
Shortnose sucker (*Chasmistes brevirostis)*	E							S			ODFW-S	Endemic to Upper Klamath Basin. Inhabits deep water of lakes, spawns in springs and tributary streams. The project would cross potential habitat within the Lost River watershed in Klamath County, Oregon.
Warner sucker (*Catostomus warnerensis)*	T					S					ODFW-S	Known in Warner Basin. Use pools of streams as adults and backwater as larvae. The project would cross designated critical habitat at Twentymile and Twelvemile creeks.
HERPTOFAUNA												
Columbia spotted frog (Great Basin population) (*Rana luteiventris)*	C	S		S	S	S	S		S		ODFW-S WGFD-SC	Occupies aquatic habitats of permanent water such as springs, streams, ponds, and lakes at 5,600 to 8,700 feet. The project would cross potential habitat in Wyoming, Utah, Nevada, and Oregon.
Mountain yellow-legged frog (*Rana muscosa)*	C											Suitable habitat consists of streams, rivers, and lakes in the Sierra Nevada Mountains. The project is outside of the species' known range. <u>This species has been eliminated from further consideration.</u>

TABLE 4.7-1

Federal Threatened, Endangered, Candidate, and Petitioned Species for the Ruby Pipeline Project

Species	FWS and Federal Land Managing Agency Status[a]											Comments
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		KFO	SLFO	EFO	WFO	SFO	LFO	KFO	FNF	CNF		
Northern leopard frog (*Rana pipiens*)	Pet	S					S		S			Breeds in a variety of waterbodies and forages in meadows, peat bogs, and areas of perennial crops. The project would cross potential habitat near MP 1, intermittently between MPs 21 to 24, and near MP 42.
Oregon spotted frog (*Rana pretiosa*)	C						S	S	S		ODFW-S	This species is highly aquatic, occurring at grassy margins of waterbodies in western Oregon. The project is outside of the species' known range. This species has been eliminated from further consideration.
INVERTEBRATES												
Carson wandering skipper (*Pseudo-copaeodes eunus obscurus*)	E											Suitable habitat consists of salt grass, nectar sources, and open areas near springs. Known populations are located in Washoe, Carson City, and Douglas counties, Nevada and Lassen County, California. The project does not cross the species' known range. This species has been eliminated from further consideration.
Elongate mud meadows springsnail (*Pyrugulopsis notidicola)*	C				S							Endemic to Soldier Meadow in Humboldt County, Nevada. The project does not cross the species' known range. This species has been eliminated from further consideration.
Fat-whorled pondsnail (Stagnicola bonnevillensis)	C		S								UDWR-S	Inhabits spring-fed pools up to an acre in size with varied substrates consisting of mud to rocks that are well vegetated. Known to occur in five ponds fed by three springs in Box Elder County, Utah. The project would cross intermittent ditches and tributaries of the ponds 4 miles east and 6.5 miles north. Ruby's use of its Procedures and the distance to the ponds would avoid impacts on this species. This species has been eliminated from further consideration.
Mardon skipper butterfly (*Polites mardon)*	C								S			Dependent upon native, fescue-dominated grasslands. Known in the Cascade Range of southern Oregon. The project is outside of the species' known range. This species has been eliminated from further consideration.
VASCULAR PLANTS												
Applegates milk-vetch (*Astragalus applegatei)*	E											Endemic to the lower Klamath Basin near the city of Klamath Falls in south-central Oregon. Occurs in flat, seasonally moist remnants of alkaline floodplain grasslands at about 4,000 feet. Almost all known plants occur on a single site in an urbanized area. The project is outside the species' known range. This species has been eliminated from further consideration.

TABLE 4.7-1

Federal Threatened, Endangered, Candidate, and Petitioned Species for the Ruby Pipeline Project

Species	FWS and Federal Land Managing Agency Status[a]										Comments
	FWS Status	BLM Field Offices						Forest Service		State Status[b]	
		KFO	SLFO	EFO	WFO	SFO	LFO	KFO	FNF	CNF		
Blowout penstemon (*Penstemon haydenii)*	E	S									Found in sparsely vegetated, early successional habitats of sand dune blowouts created by wind erosion, primarily on the rim of the leeward slopes of the blowout. Occurs on sand dunes in the Ferris Mountains of Wyoming approximately 160 miles east of Opal. The project is outside the species' known range. This species has been eliminated from further consideration.
Gentner's fritillary (*Fritillaria gentneri)*	E										Suitable habitat consists of openings in oak woodlands, conifer stands, and conifer-deciduous forests. Known from Jackson and Josephine Counties, Oregon. The project is outside the species' known range. This species has been eliminated from further consideration.
Goose Creek milkvetch (*Astragalus anserinus)*	C		S	S							Known from Goose Creek basin within Idaho, Utah, and Nevada. Inhabits sandy, rhyolitic ash from the Salt Lake formation. Found sympatric with Utah juniper, big sagebrush, and rabbitbrush at 4,830 to 5,880 feet above mean sea level. The closest population occurs between 20 and 25 miles from the project. This species has been eliminated from further consideration.
Greene's tuctoria (*Tuctoria greenei)* [d]	E										Inhabits vernal pools in California. Ruby surveyed the project area for potential habitat in Oregon and none was identified.
Maguire's primrose (*Primula maguirei)*	T		S								Prefers north-facing, moss-covered limestone cliffs at or near the canyon bottom, at 5,100 to 5,500 feet above mean sea level. Restricted to Logan Canyon in Cache County, Utah, approximately 15 miles north of the project. This species has been eliminated from further consideration.
Slender orcutt grass (*Orcuttia tenius)* [d]	T										Inhabits vernal pools in California. Ruby surveyed the project area for potential habitat in Oregon and none was identified.
Soldier meadows cinquefoil / Black Rock potentilla (*Potentilla basaltica*)	C					S					Known from two occurrences in southwestern Humboldt County, Nevada and two occurrences in California. Prefers southeast slopes and moist salt-crusted clay in alkaline meadows with thermal springs between 4,380 and 4,580 feet above mean sea level. Potential habitat is not present near the project. This species has been eliminated from further consideration.
Steamboat buckwheat (*Eriogonum ovalifolium var. williamsiae*)	E										Known from the Steamboat Hot Springs area of Washoe County, Nevada. Grows in young soils deposited by thermal spring flows. The project is outside the species' known range. This species has been eliminated from further consideration.
Tahoe yellow cress (*Rorippa subumbellata*)	C										Endemic to the shore zone of Lake Tahoe in Nevada. The project is outside the species' known range. This species has been eliminated from further consideration.

TABLE 4.7-1

Federal Threatened, Endangered, Candidate, and Petitioned Species for the Ruby Pipeline Project

Species	FWS and Federal Land Managing Agency Status[a]											Comments
	FWS Status	BLM Field Offices							Forest Service		State Status[b]	
		KFO	SLFO	EFO	WFO	SFO	LFO	KFO	FNF	CNF		
Ute ladies'-tresses (*Spiranthes diluvialis*)	T	S										Known to occur in Converse, Goshen, Laramie, and Niobrara counties, Wyoming. Known along the Wasatch front in Utah; however, no documentations have been reported in counties crossed by the project in Utah. Grows in the moist soils of perennial rivers, streams, wet meadows, springs, seeps, and suitable excavations. Field surveys conducted by Ruby in 2008 did not locate the species along the right-of-way, although the species is known to occur in the vicinity. Ruby's surveys identified 18 areas as having marginal to moderate habitat for this species.
Webber's ivesia (*Ivesia webberi*)	C											Known from western Nevada on shrink-swell clay soils that support low sagebrush and squirreltail. The project is outside the species' known range. This species has been eliminated from further consideration.

a FEDERAL STATUS (E = Endangered, T = Threatened, C = Candidate, S= Sensitive, Pet = Petitioned)

b STATE STATUS (for informational purposes only. State special status species are discussed in section 4.7.4 and are presented in Appendix U) (E = Endangered, T= Threatened, S= Sensitive, SC = Species of Concern, SP = State protected, NSS1 = Populations greatly restricted or declining, extirpation possible-or-Ongoing significant loss of habitat)

c EXPN = Experimental population, non-essential

d Although this species was determined to not occur in the project area and therefore would not be affected by the proposed project, we have kept our text discussion in section 4.7.2.5 to present the additional surveys and analysis and to further justify our effects determination.

KFO = Kemmerer Field Office
SLFO = Salt Lake Field Office
EFO = Elko Field Office
WFO = Winnemucca Field Office
SFO = Surprise Field Office
LFO = Lakeview Resource Area
KFFO = Klamath Falls Resource Area
FNF = Fremont National Forest
CNF = Cache National Forest

Ruby's primary measures to minimize impacts on special status species have been and would continue to be developed in consultation with applicable resource agencies, and include:

- restoration of preconstruction topography to the greatest extent practicable;
- revegetation of disturbed areas with appropriate seed mixes that would eventually restore habitat characteristics, including native grasses, shrubs, and trees;
- replanting trees within forested areas on federal land and replanting trees and shrubs within riparian areas;
- collecting or purchasing seeds of salt heliotrope and planting the seeds within the right-of-way at known population locations;
- control of noxious weeds;
- blocking or discouraging unauthorized post-construction access to the right-of-way with boulders or timber debris;
- incorporating route realignments around certain habitat features;
- creating small shrub patches within the right-of-way and utilizing "zig-zag" clearing patterns in heavily forested areas to reduce edge effects;
- application of additional best management practices to reduce impacts on sagebrush-dependent species;
- application of spatial buffers, seasonal no-construction timing constraints, and restrictions on aboveground facilities around habitat features such as nests, breeding areas, or wintering areas;
- utilizing dry-crossing methods for flowing waterbodies that contain special status fish;
- abiding by seasonal, agency-specified, in-water work windows;
- developing site-specific waterbody crossing plans for several waterbodies in Oregon that contain special status fish;
- limiting water withdrawal to 10 percent of a waterbody's base flow and no more than 2,500 gpm;
- screening water withdrawal intake hoses to prevent fish entrapment as described in section 4.6.1.5;
- maintaining experienced biologists at sensitive habitats to report any impacts on black-footed ferrets, Ute ladies'-tresses, and federally listed fish that may become entrapped during waterbody crossings, and to initiate conservation measures as necessary; and
- developing and implementing, with cooperating federal and state agencies, conservation agreements for greater sage-grouse and pygmy rabbits, and agreements for migratory birds and ESA species.

We have considered potential impacts on special status species with regards to Ruby's commitments. Federally listed species that may be affected are discussed individually in section 4.7.2. Federal candidate species and those petitioned for federal listing that may be affected are discussed in section 4.7.3. BLM-, USFS-, and state-listed species that may be affected are discussed in section 4.7.4, by habitat association.

4.7.2 Federally Listed Threatened and Endangered Species

While Ruby has conducted a proactive effort, in coordination with numerous agencies and landowners, to route, construct, and maintain the pipeline and associated features in a fashion that would minimize impacts on ESA-listed species and designated critical habitats, adverse effects to listed species and critical habitats may still occur. Through a voluntary agreement with the FWS, Ruby proposes to implement and/or fund measures that are clearly beneficial to listed species and their habitats and that would assist with recovery of these species. This voluntary ESA Conservation Action Plan is separate

from, and in addition to, any reasonable and prudent measures that the FWS may impose as part of the Section 7 consultation process for the project. Likewise, the actions in the ESA Conservation Action Plan are not required for, or a part of, the project that is currently being reviewed under NEPA. To the extent any of the conservation actions identified in the ESA Conservation Action Plan require a NEPA analysis, such analysis would be conducted separately from the NEPA process for the Ruby Pipeline Project. Additionally, the project could proceed without the voluntary conservation measures in the ESA Conservation Action Plan, and, conversely, conservation actions identified in the ESA Conservation Action Plan could proceed regardless of whether the Ruby project were authorized.

Ruby, the BLM, FWS, and state wildlife management agencies have drafted an ESA Conservation Action Plan (ESA Plan) (Appendix M) for ESA-listed species that would be impacted by The Ruby Pipeline Project. The current version of the ESA Plan is provided in Appendix M. The ESA Plan is expected to be finalized and signed in early 2010. This voluntary plan is separate from, and in addition to, any reasonable and prudent measures that the FWS may impose as part of the Section 7 consultation process for the project. Likewise, the actions in the ESA Plan are not required for, or a part of, Ruby's proposal that is analyzed in this NEPA document. As such, any of the specific actions identified in the plan would be subject to NEPA analysis separate from the analyses presented in the draft EIS or this final EIS.

The FWS agrees that the ESA Plan conservation actions would provide conservation benefits to listed species and their habitats and would assist with conservation and/or recovery of these species. The ESA Plan conservation actions (1) have been extracted from listed species recovery plans, other ESA action plans, or recovery team activities; (2) reflect high-priority actions for these listed species and critical habitats; and (3) would offset the project's adverse impacts on listed species and their critical habitats that are not otherwise offset or addressed though regulatory requirements associated with the various permits, authorizations, and other approvals required for the project. The ESA Plan would assist with conservation of listed species, in conjunction with Ruby's existing proposed actions and any reasonably and prudent measures that may be identified in the FWS's Biological Opinion for the Ruby project.

4.7.2.1 Black-Footed Ferret

The black-footed ferret is a federally listed endangered species and a BLM sensitive species in Wyoming. Black-footed ferrets have been reintroduced in large prairie dog colonies or complexes in Wyoming, Utah, Colorado, Montana, South Dakota, Kansas, New Mexico, Arizona, and Mexico (FWS, 2008c). There are no other known wild populations of black-footed ferret. However, white-tailed prairie dog colonies or complexes greater than 200 acres with an average intact burrow density of 8 burrows per acre are considered potential suitable habitat unless they have been "block-cleared" for ferret presence (*i.e.*, the FWS has determined that black-footed ferrets do not occur in the area) (FWS, 1989). Black-tailed prairie dog towns greater than 80 acres are also considered potential suitable habitat for the black-footed ferret (FWS, 1989). Critical habitat has not been designated for the black-footed ferret.

Black-footed ferrets could be impacted by the project if occupied habitat were crossed or if habitat suitable for black-footed ferret reintroduction were negatively affected. Ruby conducted surveys for white-tailed prairie dog colonies and black-footed within 0.5 mile of the pipeline right-of-way between MPs 12 and 29 in Wyoming and MPs 48 and 60 in Utah. The pipeline right-of-way between MPs 0 and 12 and MPs 29 and 48 has been previously block-cleared by the FWS (BLM, 2008b); therefore, surveys were not conducted in these areas. White-tailed prairie dog surveys were conducted in July 2009 and black-footed ferret surveys were conducted in August and September 2009. All surveys were conducted using protocol described in *Guidelines for Black-Footed Ferret Surveys* (FWS, 1989).

A total of 34 white-tailed prairie dog towns were located within 0.5 mile of the right-of-way in Wyoming. Total acreage for these 34 towns was 1,024.05 acres. One white-tailed prairie dog town was 450 acres and had about 300 active burrows. The burrow density of this town does not meet the preferred habitat requirements for the black-footed ferret. The remaining towns in Wyoming were less than 200 acres. No black-footed ferrets were observed during the nine-day nocturnal survey in Wyoming.

A total of 25 white-tailed prairie dog towns were located within a 0.5 mile of the right-of-way in Utah. Total acreage for these 25 towns was 522.29 acres. The largest town was 134 acres with about 500 active burrows. No towns in Utah meet the preferred habitat requirements for the black-footed ferret. No black-footed ferrets were observed during the six-day nocturnal survey in Utah.

Ruby has proposed to fund a survey of the white-tailed prairie dog colonies located within the Cumberland Complex in Lincoln and Uinta counties, Wyoming as part of the ESA Plan. Construction would likely destroy some of the prairie dog burrows in this area; however, none of the towns are considered preferred habitat for the black-footed ferret, and no black-footed ferrets were observed during surveys for the species. Implementing the actions in the ESA Plan would further mitigate or compensate for impacts on this species and would assist in managing and preserving white-tailed prairie dog colonies. Based on the above analysis (primarily the crossing of prairie dog habitat), we conclude that the project *may affect, but would be unlikely to adversely affect* the black-footed ferret.

4.7.2.2 Lahontan Cutthroat Trout

The Lahontan cutthroat trout is a federally listed threatened species and is managed by the BLM as a sensitive species in the Elko, Winnemucca, and Salt Lake Field Office regions. Lahontan cutthroat trout inhabit cool, well-oxygenated waters in saline and alkaline lakes and streams. Spawning typically peaks in May and June, and occurs from March to July depending on water conditions. Primary stream habitat includes rocky areas, riffles, deep pools, and areas under logs and overhanging banks. Critical habitat has not been designated for this species.

The project's potential effect to Lahontan cutthroat trout is an issue of great concern to the Summit Lake Paiute Tribe. The tribe provided comments during the scoping period and on the draft EIS that the project could affect Lahontan cutthroat trout spawn runs, affect population of Lahontan cutthroat trout in Mahogany Creek, and affect the overall population Lahontan cutthroat trout that the tribe may harvest. None of the waterbodies crossed by the project are tributaries to Mahogany Creek. Waterbodies that are crossed near the Summit Lake Indian Reservation and the Lahontan Cutthroat Trout Natural Area either flow north and are tributaries to Craine Creek or drain to Fivemile Flat. No indirect downstream impacts on Mahogany Creek or Summit Lake would occur as a result of project activities, and no impacts on Lahontan cutthroat trout populations utilized by the Summit Lake Paiute Tribe are anticipated.

Ruby, NDOW, and the FWS also identified 22 perennial or intermittent waterbodies that have the potential to support Lahontan cutthroat trout. These waterbodies are all in Elko County, Nevada (see Appendix Q).

Potential impacts on Lahontan cutthroat trout would be similar to impacts described in section 4.6.1 for other fish species. Ruby has committed to avoiding construction within designated Lahontan cutthroat trout streams from January 1 to June 30. Ruby has agreed to cross the 22 waterbodies known to contain Lahontan cutthroat trout using a dry-ditch crossing method. Although Ruby has not specifically identified which dry crossing method would be used, Ruby has committed to maintain fish passage across the construction work area at all times. Therefore, we believe Ruby would use the flume method rather than the dam-and-pump method. None of the surface water sources proposed for hydrostatic test water and dust control are known to contain Lahontan cutthroat trout.

Under the ESA Plan, Ruby is proposing four conservation actions for Lahontan cutthroat trout. On the Marys River, Ruby would replace an irrigation diversion to allow fish passage and prevent fish entrainment. To protect Humboldt River Lahontan cutthroat trout populations from invading, non-native trout, Ruby is proposing to construct a fish migration barrier on the Upper North Fork Humboldt River. Ruby is also proposing stream improvement and restoration along portions of Rock and Willow Creeks. Finally, Ruby is proposing the installation of a fish screen on a private landowner's irrigation system to prevent entrainment of fish.

By constructing outside of the spawning season, crossing Lahontan cutthroat streams using a dry-ditch crossing method, and avoiding water withdrawals from Lahontan cutthroat streams, the project would minimize impacts on the Lahontan cutthroat trout to the greatest extent practical. Implementing the actions in the ESA Plan would further mitigate or compensate for impacts on this species. However, by modifying streamside vegetation, modifying the bed and banks of Lahontan cutthroat streams, and by possibly salvaging Lahontan cutthroat trout from the project area, we conclude that the project *may affect, and is likely to adversely affect* the Lahontan cutthroat trout. We will request in our BA to initiate formal consultation with the FWS regarding Lahontan cutthroat trout. Ruby would not be authorized to begin construction until Section 7 consultation between the FERC and the FWS is complete.

4.7.2.3 Endangered Colorado River Fish

Four endangered fish species occur within the upper Colorado River system; the Colorado pikeminnow, humpback chub, razorback sucker, and bonytail chub. All four species have been negatively impacted by dam construction, water withdrawal, and introduction of non-native fish into the Colorado River system.

Colorado pikeminnow were once abundant in the Colorado River and several tributaries in Colorado, Wyoming, Utah, New Mexico, Arizona, Nevada, California, and Mexico. The species currently occurs in the Colorado River from Palisade downstream to Lake Powell and several major tributaries such as the Duchesne, Gunnison, Little Snake, and Green Rivers. Its preferred habitat includes deep pools with a rocky or sandy substrate within medium or large rivers.

The humpback chub historically inhabited canyons of the Colorado River and the Green, Yampa, White, and Little Colorado rivers. Today the species is restricted to the Little Colorado River in the Grand Canyon and the Colorado River near the Colorado/Utah border. Its preferred habitat includes canyon white water within larger rivers.

The razorback sucker was once widespread throughout most of the Colorado River Basin. Colorado River Basin populations are currently found in the upper Green River in Utah, above Lake Powell in the Colorado River Basin, and in Lakes Mead, Mohave, and Havasu in the lower Colorado River basin in Arizona. Preferred habitat includes deep, clear to turbid waters within large canyons. Wetland fringes and backwaters are critical to young survival.

The bonytail chub historically inhabited portions of the upper and lower Colorado River Basin. Small, isolated populations currently exist in limited sections of the Yampa, Green, and Colorado rivers. Its preferred habitat includes flowing pools, backwaters, and swift runs, usually over mud or rock.

Construction and operation of the Ruby Pipeline Project would not directly impact any waterbody occupied by these four species or any waterbody that supports suitable habitat. However, the FWS indicated to us in a letter dated May 9, 2008, that any federal action resulting in water depletions to the Colorado River system would adversely affect these species.

The FWS defines a "depletion" as consumptive loss plus evaporative loss of surface or groundwater within the affected basin. Any water depletion would represent an adverse impact on habitat for the Colorado pikeminnow, humpback chub, razorback sucker, and bonytail chub and must be considered in formal Section 7 consultation. Factors to consider in determining downstream effects to listed fishes include: what time of the year water is withdrawn, whether the water has been treated, other water uses at the time of withdrawal (cumulative impacts), and how close to the withdrawal source the water is returned (*i.e.*, a source location return vs. a "basin return").

Ruby proposes to withdraw water from one waterbody within the Colorado River system, the Hams Fork River. As stated in section 4.3.2.5, Ruby intends to appropriate 16,132,371 gallons (about 49.5 acre-feet) of water from the Hams Fork River for hydrostatic testing of the pipeline and dust control. Water used for dust abatement would be applied to the construction right-of-way and generally lost to evaporation (*i.e.*, consumptive use). Ruby would discharge water used for hydrostatic testing to five locations within the Hams Fork watershed. We have recommended in section 4.3.2.5 that Ruby discharge hydrostatic test water to temporary sediment structures. A small amount of the discharged test water would evaporate; however, the majority of the water used would permeate into the local groundwater system (*i.e.*, not lost from the basin). Withdrawal and discharge of the hydrostatic test water would likely occur between August 1, 2010 and March 31, 2011, although the exact project schedule is not known at this time.

The FWS has established a Recovery Program which has established conservation measures to minimize adverse affects on the endangered Colorado fish species and their critical habitat caused by a project's water depletions. Depletion impacts would be offset by the accomplishment of activities necessary to recover the endangered Colorado fish species as specified under the Recovery Implementation Program Recovery Action Plan and the water project's proponent's one-time contribution to the Recovery Program for new depletions greater than 100-acre-feet per year. The FWS has indicated that there would be no charge for existing depletions or for new depletions less than 100 acre-feet, such as those proposed by the Ruby project. Although depletion impacts would be offset by the Recovery Program, the FERC would retain discretionary federal authority for the project consistent with applicable regulations and Recovery Program provisions should Section 7 consultation be required.

Implementing the actions in the ESA Plan would further mitigate or compensate for impacts on these species. Under the ESA Plan, Ruby would implement or provide funding for the enhancement of riparian habitats in the Green River basin. Enhancement would include the removal of tamarisk and planting of native willow. Monitoring would also occur and follow-up spot treatments may occur. These actions are intended to improve stream morphology, enhance habitat, and minimize water loss due to the high transpiration rate of tamarisk.

Although Ruby's proposed water withdrawal from the Colorado River Basin is considerably less than 100 acre-feet, it still represents a substantial quantity of water that may contribute to depletion effects to Colorado River Basin listed fishes. Consequently, we have determined the proposed project *is likely to adversely affect* the Colorado pikeminnow, humpback chub, razorback sucker, and bonytail chub. We will request in our BA to formally consult with the FWS on depletion-related effects to these four species. Ruby would not be authorized to appropriate water from the Colorado River Basin until Section 7 consultation between the FERC and the FWS is complete.

4.7.2.4 Lost River Sucker, Modoc Sucker, Shortnose Sucker, and Warner Sucker

The Lost River sucker, Modoc sucker, shortnose sucker, and Warner sucker are known to occur in southeastern Oregon streams, rivers, and lakes. The Warner sucker is a federally threatened species;

the three other species are federally endangered. These fish occur in relatively shallow lakes and their tributaries in the Upper Klamath, Warner Basin, and Goose Lake watersheds. The Warner sucker has been documented in Twelvemile Creek in an area less than 1 mile upstream and downstream of the proposed pipeline crossing. Each species was historically abundant but has declined substantially in the past 50 to 100 years due to the combined effects of dam construction, wetland and lake draining and dredging, stream channelization and sedimentation, overgrazing by livestock, removal of natural stream bank vegetation, and predation by non-native fish. Critical habitat has been designated for the Warner sucker in Twelvemile Creek and Twentymile Creek. A petition to propose critical habitat for the Lost River sucker and shortnose sucker was submitted in 1994; however, the petition was never finalized. Table 4.7.2-1 presents known locations and critical habitat for each species.

TABLE 4.7.2-1

Waterbodies Known to Contain the Lost River Sucker, Modoc Sucker, Shortnose Sucker, and Warner Sucker for the Ruby Pipeline Project

Species	Waterbody	Approximate MP	Critical Habitat Crossed
Lost River Sucker	South Arm of East Willow Creek	639.3	None
	North Fork Willow Creek	642.6	None
	Lost River	R665.2	None
Modoc Sucker	Thomas Creek	619.9	None
Shortnose Sucker	South Arm of East Willow Creek	639.3	None
	North Fork Willow Creek	642.6	None
	Lost River	R665.2	None
Warner Sucker	Twelvemile Creek	588.3	Designated
	Twentymile Creek	596.0	Designated

The ODFW provided Ruby with basin-specific, in-water work windows to limit impacts on fish (see table 2.3.2-1), and Ruby has agreed to implement the timing restrictions. Ruby has committed to crossings all waterbodies that have flow at the time of construction and are known to support special status species using a dry crossing method. However, the Lost River (MP R665.2), which is 360 feet wide at the proposed pipeline crossing location, would likely be crossed using the wet open-cut crossing method (although Ruby has not yet indicated how it proposes to cross the waterbody). Ruby has filed waterbody crossing plans for Twelvemile Creek, Twentymile Creek, Thomas Creek, and Lost River. Although Ruby has not filed plans for the North Fork Willow Creek and the South Arm of East Willow Creek, we have reviewed Ruby's alignment sheets and determined Ruby would use a nominal 115-foot-wide construction right-of-way when crossing these waterbodies and would not locate extra workspace within 50 feet of these waterbodies or associated riparian wetland habitats.

The crossing plans that Ruby has filed fail to identify the in-stream work windows agreed to by Ruby, do not state that a dry crossing must be used at these waterbodies, and do not provide justification for locating extra work space in and within 50 feet of these waterbodies and associated wetland and woody riparian areas. Therefore, **we recommend that Ruby revise the site-specific waterbody crossing plans for Twelvemile Creek, Twentymile Creek, Thomas Creek, and Lost River. These plans should include the proposed crossing method, seasonal timing restrictions, Ruby's proposed construction procedures, and any other measures that would minimize impacts on the Lost River sucker, Modoc sucker, shortnose sucker, and Warner sucker. In addition, Ruby should file the results of any consultation with the FWS, Reclamation, and ODFW regarding the crossing method and conservation measures for the Lost River. Ruby should not begin any construction activities in these waterbodies until:**

a. FERC staff receives the requested information, as well as any comments from the FWS, Reclamation, and ODFW;

b. staff completes any necessary Section 7 consultation with the FWS; and

c. Ruby has received written notification from the Director of OEP that construction or use of mitigation may begin.

As discussed above, critical habitat for the Warner sucker would be crossed where the project crosses Twentymile and Twelvemile Creeks. A 50-foot riparian zone on each side of these creeks is also included as critical habitat. The FWS has determined that the maintenance of this riparian zone is essential in protecting the integrity of the stream ecosystem and to the conservation of the Warner sucker.

The FWS has identified certain activities which may adversely modify these critical habitats or affected their designation. These activities are: 1) overgrazing by livestock, which would eliminate riparian vegetation and lead to streambank erosion and subsequent siltation of the stream and lake environment; 2) introduction of exotic fishes into streams or lakes of the Warner Valley, which might compete with or prey on Warner suckers; 3) construction of additional diversion dams that do not have adequate fish passage facilities on streams inhabited by the Warner sucker; 4) channelization or diversion of streams inhabited by the Warner sucker; 5) application of herbicide or insecticide along stream courses or lakes inhabited by the Warner sucker, which could be toxic to the species or its food; 6) pollution of stream or lake habitat by silt or other pollutants; and 7) removal of natural vegetation within or along inhabited streams. For the Ruby Pipeline Project, activities 5, 6, and 7 have the potential to affect critical habitat and affect the Warner sucker.

We have previously addressed the likely degree of sedimentation and the measures Ruby has proposed to reduce these impacts. Herbicide application has been proposed for use on the project. Ruby has developed a Noxious and Invasive Weed Control Plan (Appendix T) to prescribe methods to prevent, mitigate, and control the spread of noxious weeds during and following construction of the project. Ruby would implement these methods in accordance with existing regulations and jurisdictional land management agency or landowner agreements. Ruby would consult with the BLM, USFS, Reclamation, and state Department of Agriculture Noxious Weed Control Programs or local County Weed Programs for additional support regarding noxious weed control issues that may occur during the pipeline operations. For noxious weed infestations in the area immediately adjacent to wetlands or waterbodies, only herbicides approved by the relevant agencies would be used. If no herbicides were to be approved for use near wetland and waterbody features, Ruby would employ manual or mechanical weed removal methods.

The construction of the project across Twentymile and Twelvemile Creeks and associated riparian habitats would affect critical habitat. Ruby has proposed several measures to minimize impacts on these streams and associated riparian habitats as discussed throughout this section of the EIS. These methods include constructing the project across these sensitive streams and their associated critical habitat during agency recommended periods, restricting water appropriations from these waterbodies, restoring stream bed and banks to preconstruction conditions, using appropriate short- and long-term erosion control measures, replanting woody riparian habitats after construction, implementing monitoring programs to identify restoration problems, and implementing remedial actions when restoration problems are identified. We have recommended additional measures that would minimize impacts on these water features and critical habitat, which include restricting extra workspaces within 50 feet of these waterbodies and limiting the construction right-of-way to 115 feet across waterbodies (see section 4.3.2.4).

Implementing the actions in the ESA Plan would further mitigate or compensate for impacts on these species. Conservation actions outlined in the ESA Plan for the Lost River sucker, Modoc sucker,

shortnose sucker, and Warner sucker include stream and habitat enhancements, construction of fish ladders to promote fish passage, installing fish screens on water diversions, funding studies to determine the location and distribution of the shortnose and Lost River sucker, and reducing sedimentation caused by a failing road.

Ruby has agreed to adopt the seasonal timing restriction within the Warner Valley, Goose Lake, and Lost River Basins that were recommended by the ODFW (see table 2.3.2-1). Ruby would utilize fish handling techniques as discussed in section 4.6.1.5 should fish be entrapped between the upstream and downstream dams during a dry-ditch crossing. Our recommendation and the conservation actions described in the ESA Plan would also minimize impacts on the Lost River sucker, Modoc sucker, shortnose sucker, and Warner sucker. However, by modifying streamside vegetation, modifying the bed and banks of streams, and by possibly salvaging these species from the project area, we conclude that the project *may affect, and is likely to adversely affect* the Lost River sucker, Modoc sucker, shortnose sucker, and Warner sucker. Additionally, we conclude that critical habitat designated for the Warner sucker *is likely to be adversely affected* by the proposed project. We will request in our BA to initiate formal consultation with the FWS regarding these four species and designated critical habitat for the Warner sucker. Ruby would not be authorized to begin construction until Section 7 consultation between the FERC and the FWS is complete.

4.7.2.5 Slender Orcutt Grass and Greene's Tuctoria

Slender orcutt grass is a federally threatened plant species found in valley grassland and blue oak woodland in vernal pools on remnant alluvial fans and high stream terraces and recent basalt flows (FWS, 2009a). It has some ability to colonize artificial habitats, such as the margins of stock ponds. A total of 82 occurrences are known, of which 76 are presumed extant, 2 are possibly extirpated, and 4 are extirpated (CNDDB, 2008). All known occurrences are in California. The closest known population to Ruby's proposed route is approximately 35 miles south of the Oregon portion of the pipeline in Modoc County, California.

Greene's tuctoria is a federally endangered plant species that grows in vernal pools. There are 41 occurrences in 9 counties in California (CNDDB, 2008). The nearest extant population is approximately 80 miles south of the proposed route in Shasta County, California.

Both slender orcutt grass and Greene's tuctoria are endemic to vernal pools. Vernal pools are seasonal wetlands that occur in shallow topographic depressions that are underlain by an impermeable soil layer that restricts the movement of water. Surface runoff from winter precipitation saturates the soil above this layer, inundating the depressions. The hydrology of vernal pools consists of three phases: an aquatic phase when the pool is filled with water from winter rains, a drying phase during early to mid-spring, and a dry phase during the summer and fall.

As requested by the FWS, Ruby surveyed the project area in Oregon in summer 2009. Ruby did not identify suitable habitat for slender orcutt grass or Greene's tuctoria. Implementing the actions in the ESA Plan would further mitigate or compensate for impacts on these species. Ruby is proposing under the ESA Plan to continue to assess the distribution of these species in Klamath and Lake Counties, Oregon. Because neither populations nor suitable habitat would be impacted by the project, we conclude that the project *would not affect* slender orcutt grass or Greene's tuctoria.

4.7.2.6 Ute Ladies'-Tresses

The Ute ladies'-tresses is a federally listed threatened orchid species that grows in moist, seasonally flooded soils near wetland meadows, springs, lakes, and streams. Plants typically inhabit point

bars, floodplains, and streambanks with low-growing, relatively sparse grass or forbs. Ute ladies'-tresses occur in several western states including parts of southwestern Wyoming, north-central and western Utah, and extreme eastern Nevada. The closest known population to Ruby's proposed route is approximately 20 to 25 miles south of the Utah portion of the pipeline. In 2008, Ruby completed surveys for the Ute ladies'-tresses at 35 areas in Wyoming and Utah according to FWS guidelines between mid-July and August 2008. Suitable habitat was determined through informal consultation with the FWS, conversations with state heritage botanists, and literature review. No Ute ladies'-tresses were identified during the 2008 surveys. Seventeen sites were determined to have no or low potential for Ute ladies'-tresses based on the absence of suitable habitat. The other eighteen sites provided moderate potential for Ute ladies'-tresses. No sites provided high potential for Ute ladies'-tresses.

Ruby conducted additional protocol surveys for the Ute ladies'-tresses in August and September 2009. Sites visited in 2009 included 21 wetland areas crossed by proposed access road corridors; one wetland area included within the proposed Glencoe Junction pipe storage and staging yard; one wetland area included within the proposed contractor/construction yard north of Corinne, Utah; and two wetland areas crossed by proposed reroutes of the pipeline corridor. In addition, 14 of the 18 sites that were characterized as exhibiting moderate quality habitat potential for the orchid species during the survey in 2008 were revisited to search for individuals or populations of the species. The remaining four sites exhibiting moderate habitat quality in 2008 were not revisited in 2009 because pipeline reroutes now avoid these wetland areas. No Ute ladies'-tresses were identified during the 2009 surveys.

Ruby has stated it would retain a botanist to conduct surveys for Ute ladies'-tresses prior to clearing in potential habitat along the project to ensure that no Ute ladies'-tresses populations were overlooked or any new colonies have established along the project.[5] Ruby would require this botanist to report any populations of Ute ladies'-tresses found during pipeline construction. Should Ute ladies'-tresses be identified during the preconstruction surveys, Ruby states it would would implement measures such as installing signs or temporary fencing to prevent pipeline construction personnel from traversing populations of Ute ladies'-tresses. However, to ensure any potential effects to this species are minimized, **we recommend that, Ruby not start construction in any area where Ute ladies'-tresses are identified during preconstruction surveys until:**

- **a. FERC staff receives the survey report for the Ute ladies'-tresses sighting, as well as any comments from the FWS regarding project impacts on this species;**
- **b. staff completes any necessary Section 7 consultation with the FWS; and**
- **c. Ruby has received written notification from the Director of OEP that construction or use of mitigation may begin.**

Implementing the actions in the ESA Plan would further mitigate or compensate for impacts on this species. Under the ESA Plan, Ruby is proposing to the preserve the only known population of Ute ladies'-tresses in Cache County, Utah. A conservation easement would be established for the property and possibly the adjacent property should surveys identify Ute ladies'-tresses on the adjacent property.

On the basis of current data (including negative survey results, and only limited, marginal- to moderate-quality habitat for this species crossed by the project); conducting additional, preconstruction surveys; implementing our recommendation; and implementing the ESA Plan, we conclude that the project *may affect, but would be unlikely to adversely affect* the Ute ladies'-tresses.

[5] This may have limited effectiveness as it is difficult to identify this species outside the late-summer flowering period.

4.7.3 Federally Petitioned and Candidate Species

4.7.3.1 Greater Sage-Grouse

The greater sage-grouse was petitioned for ESA listing in 2002 and then again in 2003. The original petition was found by the FWS to not warrant listing. However, subsequent legal challenges to the original finding resulted in a FWS determination that the greater sage-grouse status would undergo additional review to determine if the species warranted ESA protection. The FWS's decision on whether to list the greater sage-grouse is expected in February 2010. The greater sage-grouse is considered a BLM-sensitive species in all BLM districts that would be crossed by the project. Critical habitat has not been designated for this species.

The greater sage-grouse commonly utilizes multiple habitats for multiple purposes throughout the year (Braun, Connelly, and Schroeder, 2001; Connelly *et al.,* 2004). Lek sites, or courtship grounds, are crucial sites used to facilitate the breeding activities of the greater sage-grouse. Important components of lek sites include relatively open habitats with minimal sagebrush. Nesting habitat includes moderate amounts of sagebrush cover (about 23 percent) with varying heights, residual grass cover, and live forb cover. Brood-rearing habitat is defined as either early- or late-season brooding habitat; early season habitat is comprised of relatively open stands of sagebrush and high herbaceous cover while late-season habitat is comprised of riparian meadows or hay ground that supports succulent herbaceous vegetation and has a surrounding buffer of sagebrush. Winter habitat is comprised of areas where sagebrush extends 10 to 14 inches above the snow or where sagebrush is blown free of snow by wind.

Greater sage-grouse habitat occurs over much of the project area. Ruby conducted greater sage-grouse surveys for all active, inactive, historic, potential, and unknown leks within 2 miles of all project areas. Biologists conducted the surveys between March 30 and May 7 (peak lekking periods) using accepted agency protocol. Surveys identified 104 greater sage-grouse leks within 2 miles of project areas. A complete list of greater sage-grouse leks, their activity status, and locations are provided in Ruby's Comprehensive Species-Specific Survey Field Report that is available for public review on the FERC website. Twenty-three leks are within 2 miles of the proposed pipeline; nine of these leks are within 0.25 mile.

As discussed and presented in section 4.4.5, a mile-by-mile habitat analysis was conducted along the project, which included an analysis of greater sage-grouse habitat. About 143 miles of high-quality greater sage-grouse habitat is crossed by the project in Wyoming, Utah, and Nevada. In addition, 336 miles of moderate- to low-quality habitat are crossed in all four states.

Aboveground facilities, access roads, and staging areas located near leks could negatively affect greater sage-grouse. Aboveground facilities would require monitoring and maintenance and could provide perches for raptors that prey on greater sage-grouse. BLM field offices typically prohibit aboveground features within a 0.25-mile radius of known lek sites. Traffic on access roads could disturb greater sage-grouse and cause them to avoid a lek or disrupt brood-rearing. Staging areas would frequently have high levels of construction activity that could disrupt greater sage-grouse within the general vicinity.

Ruby has stated that no surface buildings or pipeline appurtenances (not including signage required by DOT, MLVs, or cathodic protection test facilities) would be occupied or constructed within 0.6 mile of known active leks. Thirty-two leks are within 2 miles of the proposed access roads. Twenty-three of these leks are within 0.25 mile. Some of these roads would be graded to facilitate construction traffic and later reclaimed as close as possible to preconstruction conditions; this would include, at a minimum, "pull-back" of graded road material from both sides of the road to original widths and seeding

of any widened road edge. Access roads would be used extensively during pipeline construction and restoration activities and occasionally during operation to conduct monitoring and maintenance of pipeline facilities. Construction-related activities also would occur at temporary extra workspaces, staging areas, and contractor/pipe yards. These activities could discourage birds from using leks or disrupt brood-rearing near these areas.

The degree of impact on greater sage-grouse would depend on the proximity of construction activities to habitat and leks and the amount of habitat that would be affected by the project. Potential direct impacts could include nest abandonment, dispersion of individuals from preferred habitat, and mortality due to collision with project vehicles. Long-term impacts could be associated with habitat fragmentation, loss, or degradation. Greater sage-grouse are fairly mobile and could fly over the project area to reach adjacent habitats. Once shrub cover was established on the right-of-way, greater sage-grouse could also walk across the right-of-way with a relatively low probability of increased predation. The right-of-way would not present a permanent physical barrier to greater sage-grouse movement if revegetation were accomplished successfully (Connelly, 2009).

Potential construction-related impacts would be lessened by applying seasonal no-construction buffers around active greater sage-grouse leks. Through coordination with state agencies, Ruby has agreed to adopt the following construction restrictions for greater sage-grouse leks:

- avoid construction within 3 miles of an occupied/active greater sage-grouse lek within designated core areas from March 15 to June 30 and within 2 miles of an active greater sage-grouse lek outside designated core areas from March 15 to June 30 throughout Wyoming;
- avoid construction within 4 miles of an occupied/active greater sage-grouse lek between March 1 and June 15 throughout Utah; and
- avoid construction within 2 miles of an occupied/active greater sage-grouse lek between March 1 and May 15 throughout Nevada.

The BLM Kemmerer District has requested that Ruby avoid human activity from 8:00 p.m. and 8:00 a.m. between March 1 and May 15 within 0.25 mile of the perimeter of active leks, which is consistent with Ruby's proposed construction restrictions.

Potential habitat degradation or loss could occur if revegetation does not restore habitat characteristics important to greater sage-grouse. Primary impediments to successful habitat restoration include wildfire impacts and invasion by cheatgrass or other weedy species and the slow reestablishment of sagebrush in many areas. Cheatgrass frequently invades disturbed lands in the Great Basin (McArthur *et al.,* 1989). Wildfires in former sagebrush areas now dominated by cheatgrass are burning at shorter fire rotations (Baker, 2006). Wildfires from 1999 to 2007 resulted in an approximate 2.5-million acre loss of key sagebrush habitat in Nevada (Espinosa and Phenix, 2008). However, a study of native restoration along a 228-mile pipeline right-of-way in northwestern Nevada and northeastern California found that the initial increase in cheatgrass cover on the right-of-way subsided to levels similar to that of adjacent lands within 5 to 8 years (WESTECH, 2004). Native, seeded vegetation was frequently well-established on the right-of-way within 5 years in areas where the adjacent vegetation was also in good condition. Shrubs, particularly big sagebrush and green or rubber rabbitbrush, were well established on approximately 50 percent of the right-of-way within 8 years. The success of greater sage-grouse habitat restoration on the construction right-of-way would be dependent on construction and reclamation practices, climate, and adjacent vegetation conditions.

Ruby has developed several seed mixtures in consultation with the NRCS and BLM. Local collections of big sagebrush seed have been specified for some areas. Ruby has identified other best

management practices to improve sagebrush reestablishment but has not specified where these practices would be applied. The BLM, FWS, and several state wildlife agencies have provided comments regarding greater sage-grouse habitat restoration efforts. These comments suggested that Ruby employ a range of procedures from using HDD to cross large tracts of intact big sagebrush to planting or seeding locally collected sagebrush on the right-of-way. However, these agencies have not identified specific locations where specific habitat restoration procedures are recommended. Further, the use of certain conservations measures, such as using the HDD method to cross habitat, may not be the most effective measure to reduce impacts on greater sage-grouse habitat. HDDs are used on occasion to cross small tracts; for example, to avoid direct impacts on site-specific resources such as waterbodies, discrete and contained sensitive plant populations, and known locations of sensitive cultural resource sites. However, an HDD would require large staging workspaces to set up drilling rigs and may require extensive pipe fabrication workspaces to complete the HDD. The amount of land disturbance that may occur in these circumstances may outweigh any benefit received from using the HDD as compared to standard and specialized construction and restoration procedures.

Ruby has committed to seeding locally collected sagebrush and other shrub seed; however, we recognize that other methods may also be effective at establishing sagebrush. Mowing, hydro-axing, or harrowing with a Dixie harrow has been used to stimulate sagebrush recruitment and herbaceous understory production (ARS, 2008; BLM, 2008c; BLM, 2004a). Although mechanical removal of sagebrush decreases sagebrush structure in the short-term, mechanical removal is often less damaging to vegetation than removing the vegetation along with the topsoil horizon. A study of a power line right-of-way in northeastern California indicated that shrubs reestablished more quickly in areas that were mowed than in areas where the topsoil horizon was salvaged, stored, and replaced (WESTECH, 2001a). Other efforts to promote sagebrush habitat restoration include seeding high rates of native, palatable forbs within lek and breeding habitat to minimize the spread of invasive species and provide habitat and a food source to greater sage-grouse until sagebrush restoration is complete (CDOW, 2008).

Two of the four proposed compressor station sites (Roberson Creek and Weiland Flat) are located in the vicinity of suitable greater sage-grouse habitat. The new noise sources could impact the greater sage-grouse, especially during the breeding and nesting season. Female greater sage-grouse use the acoustic component of male displays to locate leks and select a mate. Lyon and Anderson (2003) found that females had lower nest initiation rates and moved farther from leks to initiate nests when noise sources were present. Males may respond by increasing the frequency and amplitude of their calls. The closest known lek to a proposed compressor station is the East Devil's Gate Lek #NOFO-114, which is an occupied inactive lek (not requiring a seasonal construction buffer) about 1.6 miles from the proposed Wieland Flat Compressor Station site. At a distance of 1.6 miles, the increase in noise generated from the compressor station would be about 4 to 8 dB. While this noise level is not likely to disturb behavior at the identified lek site, the potential exists for compressor station noise to either disturb greater sage-grouse using suitable habitat closer to the station, or effectively remove that habitat from future use if the birds were to avoid it entirely.

Ruby conducted a greater sage-grouse habitat and impact analysis for the four proposed compressor stations (see Appendix M). The locations of the new compressor stations do not occur within any agency lek buffers that stipulate no surface occupancy. The Roberson Creek and Wildcat Hills compressor stations would require seasonal restrictions for construction activities. Compliance with the seasonal restriction can be adhered to for the Wildcat Hills Compressor Station (March 1 through June 15). The Roberson Creek Compressor Station is located within core greater sage-grouse habitat that has a seasonal restriction of March 15 through June 30. Ruby is pursuing options with federal and state agencies in Wyoming to determine if a waiver can be provided to allow construction of the Roberson Creek Compressor Station prior to June 30. There are currently three existing compressor stations operating near Ruby's proposed Roberson Creek Compressor Station site. Questar operates its Roberson

Creek Compressor Station south and adjacent to the proposed site, Williams operates its Muddy Creek Compressor Station about 1,250 feet south of the proposed site, and Kern River operates its Muddy Creek Compressor Station about 2,500 feet south of the proposed site. We believe Ruby's siting of its Roberson Creek Compressor Station in an area already developed by similar industrial facilities would not significantly change the existing noise environment in the vicinity, and that construction of the compressor station within the seasonal restriction period (March 15 to June 30) would not significantly affect greater sage-grouse lekking or breeding habitats in the area.

Construction of the pipeline and associated infrastructure would result in immediate direct and indirect impacts on greater sage-grouse and pygmy rabbits and on both species' habitats. However, restoration of disturbed areas associated with the right-of-way and associated facilities would not fully offset the permanent disturbance of new roads, compressor stations, and other permanent facilities. In addition, restoration and rehabilitation activities would not mitigate residual impacts on the species and their habitats that would continue until the disturbances are fully revegetated and restored.

To mitigate the residual impacts associated with the loss of habitat function during pipeline restoration activities and pipeline operations and to provide conservation benefits to the species, Ruby, the BLM, and the wildlife management agencies in Wyoming, Utah, Nevada, and Oregon, with support and assistance from the FWS, have drafted a Cooperative Conservation Agreement (Cooperative Agreement) and an associated conservation plan for greater sage-grouse and pygmy rabbits (see Appendix M). The conservation plan represents a collaborative effort between Ruby and state and federal agencies to identify appropriate conservation actions for greater sage-grouse and pygmy rabbit populations within and in the vicinity of the Ruby pipeline right-of-way. Any of the specific conservation actions identified in the Cooperative Agreement and associated plan would be subject to NEPA review separate from the analyses presented in this final EIS.

The draft conservation actions are based on potential measures each agency and state would like Ruby to implement. According to the agencies, these projects would benefit greater sage-grouse, pygmy rabbit, and migratory bird habitats, as well as other wildlife species. This list of projects is based on management needs found in the state and local working-group greater sage-grouse plans. Collectively, these projects would contribute to restoring vegetation and reducing the threat of habitat fragmentation Examples of such projects include sagebrush-steppe restoration, riparian restoration, spring enhancement, rangeland reseeding, burn-area reseeding, invasive-weed control, livestock exclosures, fuels management, conservation easements, and land acquisition.

The conservation agreement and plan identify appropriate compensation ratios and acreages to offset the residual impacts associated with pipeline construction and to compensate for the spatial and temporal loss of habitat that would occur as a result of project construction activities. A Habitat Evaluation Analysis was completed to identify appropriate acreages and ratios of conservation and enhancement projects. According to the BLM, the project would impact approximately 11,151 acres (58.4 percent) of greater sage-grouse and pygmy rabbit habitats. Of the total disturbance, 1,205 (10.8 percent) would occur in Wyoming; 1,525 acres (13.7 percent) would occur in Utah; 7,192 acres (64.5 percent) would occur in Nevada; and 1,229 acres (11.0 percent) would occur in Oregon. Of this, the BLM contends that most would be restored over a 5- to 100-year period using the methods identified in Appendix L.

The Habitat Evaluation Analysis completed as part of the greater sage-grouse and pygmy rabbit conservation plan (Appendix M) quantified the compensation acreages necessary to mitigate and offset the direct impacts associated with the disturbance to the sage-steppe ecosystem. It also considered the indirect impact on habitat functionality that would occur as a result of noise and dust impacts on areas immediately adjacent to project construction areas, as well as the fragmentation of habitats that would

result from pipeline and road construction. Residual impacts associated with long-term loss of sage habitats (some sage species require 100 years or more to reach full restoration) and permanent losses associated with the compressor location and permanent roads were also factors in the Habitat Evaluation Analysis for sage-grouse and pygmy rabbit. According to the BLM, results of the Habitat Evaluation Analysis indicate that 16,066 acres of greater sage-grouse habitat of similar quality to that impacted would need to be purchased, enhanced, or created to offset the indirect and residual effects that would not be fully mitigated by vegetation restoration activities in areas disturbed by the project (table 4.7.3-1). The 16,066 acres of habitat would be in addition to the restored project right-of-way and associated temporary infrastructure (temporary access roads, storage yards, *etc*.).

TABLE 4.7.3-1

Acres Required by States to Compensate for the Direct, Indirect, and Residual Impacts on Greater Sage-Grouse Habitat Associated with Construction of the Ruby Pipeline Project

Vegetation Type	State				
	Wyoming (acres)	Utah (acres)	Nevada (acres)	Oregon (acres)	**Total (acres)**
Grassland/Herbaceous	4.6	9.2	44.4	0.6	**58.8**
Riparian	2.8	5.9	3.0	2.3	**14.0**
Sagebrush Steppe	1,471.7	2,026.5	6,782.6	1220.9	**11,501.6**
Salt Desert Shrub	293.4	1,877.9	2,099.6	133.4	**4,404.2**
Shrubland	0.1	68.0	4.2	14.8	**87.0**
Total	**1,772.5**	**3,987.5**	**8,933.6**	**1,372.0**	**16,065.6**

a This data was provided by the BLM.

According to the BLM, current rangewide distribution of the greater sage-grouse is estimated at 165,168,000 acres (258,075 square miles) (FWS, 2008d). In the Conservation Plan, vegetation was quantified within a 10-mile buffer centered on the pipeline (*i.e*., 5 miles on each side of the pipeline). Patches of greater sage-grouse habitat were mapped within the 10-mile buffer, and 1,614,210 acres were identified as greater sage-grouse habitat patches that would be intercepted by the pipeline. The Conservation Plan estimates that 0.9 percent of greater sage-grouse habitat within these patches would be impacted by the project. This impacts less than 0.01 percent of the habitat within greater sage-grouse range.

The Ruby Pipeline Project would directly disturb approximately 16,427.5 acres of land (greater sage-grouse habitat and other habitat) for construction, including the pipeline right-of-way, temporary extra workspaces, contractor yards, access roads, and aboveground facilities. This is 1.5 percent of the greater sage-grouse habitat available along the pipeline and less than 0.02 percent of the land within its range. Operation of the pipeline would require approximately 4,268 acres of land, or about 0.3 percent of greater sage-grouse habitat within the buffer and less than 0.003 percent of the land within its range.

Impacts related to loss of habitat and disruption of greater sage-grouse behavior would occur in the immediate vicinity of the pipeline during construction and revegetation. However, these impacts would be relatively localized and short term, given the small proportion of available greater sage-grouse habitat that would be permanently impacted. Adherence to BLM and state timing and spatial avoidance stipulations for greater sage-grouse would lessen these impacts. Some residual impacts on greater sage-grouse habitat would continue until the pipeline corridor is fully revegetated and the conservation projects discussed above are fully implemented. However, implementation of the conservation measures and the

Cooperative Agreement and associated plan for greater sage-grouse would likely result in reduced impacts on greater sage-grouse and its habitat. The implementation of conservation efforts (removing unnecessary fences, enhancing existing habitats, *etc.*) in the landscape around the pipeline corridor could have long-term beneficial impacts on greater sage-grouse and other sage obligate species that would extend beyond the life of the pipeline project. These long-term benefits could include increased nesting, brood rearing, lekking, or wintering habitat quality that could be realized through completion of conservation projects focused on habitat enhancement. Although the Ruby project might impact the greater sage-grouse, it would not cause population-level effects nor lead to a trend toward federal listing, given the implementation of the Cooperative Agreement and associated plan, the relatively small disturbance of sage habitat (when compared to its overall availability in Wyoming, Utah, Nevada, and Oregon), adherence to BLM timing and spatial stipulations, and the requirement for pipeline revegetation and restoration.

If the appropriate conservation projects and acreages are implemented and the signatory agencies agree, the conservation plans in Appendix M would appropriately mitigate the direct, indirect, and residual impacts. To ensure that the necessary projects to fully offset impacts are funded, Ruby has committed dedicated funding for the purposes of completing greater sage-grouse and pygmy rabbit conservation measures identified in the greater sage-grouse and pygmy rabbit conservation plan in Appendix M.

4.7.3.2 Yellow-Billed Cuckoo

The yellow-billed cuckoo (western distinct population segment) is a federal candidate species and a BLM sensitive species in Wyoming, Utah, and Nevada. The yellow-billed cuckoo inhabits woodlands with a dense scrub understory that are often near water, and generally breeds in the project area from mid-June through July. Suitable habitat is limited in the project area to a few rivers and large streams with associated woody riparian vegetation in Wyoming and Utah.

Through consultations with FWS, the WGFD, the UDWR, and a site visit at possible yellow-billed cuckoo nesting habitat areas along the proposed pipeline corridor in Cache County, Utah, by a sensitive species biologist with the UDWR, suitable nesting habitat and the need for yellow-billed cuckoo surveys were identified. Two areas in Wyoming were originally considered to have potential yellow-billed cuckoo habitat: the pipeline crossing of the Hams Fork River (MP 1) and an access road (LW6) crossing of the Hams Fork River. The WGFD subsequently determined that these two areas did not provide suitable habitat for the yellow-billed cuckoo and that surveys in these areas would not be required. Five areas in Utah were considered as having potential yellow-billed cuckoo habitat: the pipeline crossing of the Bear River (MP 52.9), Woodruff Creek (MP 60.9), East Fork of the Little Bear River (MPs 92.1 to 92.8), South Fork of the Little Bear River (MP 94.9), as well as an access road (C18) crossing at the South Fork of the Little Bear River. We determined that suitable nesting habitat does not exist at the Bear River and Woodruff Creek crossings due to a lack of tree canopy and continuous dense shrub layers, and these areas did not require survey for the yellow-billed cuckoo.

The riparian areas where the proposed pipeline corridor crosses the East and South Forks of the Little Bear River have a greater potential for yellow-billed cuckoo habitat. These areas exhibit perennial flows and riparian areas supporting stands of willows and dogwood with occasional canopies of trees. The yellow-billed cuckoo has been observed in these areas in the recent past, and a decision was made by both Ruby biologists and agency personnel working on the project to conduct surveys at these locations.

Ruby conducted surveys at four locations: two locations adjacent to the East Fork of the Little Bear River along the proposed pipeline corridor and in an associated staging area; and two at the proposed pipeline corridor crossing and adjacent to the South Fork of the Little Bear River and Spring

Branch drainage where access road C18 crosses. Surveys were conducted in the early morning on August 18 and September 1, 2009, according to FWS survey protocol (FWS, 2009c).

The surveys identified marginal quality riparian habitat for the yellow-billed cuckoo. Extensive intact areas with dense shrubby vegetation and trees are limited due to previous fragmentation of the riparian habitat. The UDWR confirmed this site assessment. No yellow-billed cuckoos were seen or heard at any of the survey locations during either of the survey sessions. The survey results don't preclude the possibility of yellow-billed cuckoos in the area; however, the existing lack of suitable habitat acreage and vegetation canopy structure and density at these locations may already limit any future nesting sites. We conclude that while the project might impact possible habitat for the yellow-billed cuckoo, it would not cause population-level effects, nor lead to a trend toward federal listing.

4.7.3.3 Pygmy Rabbit

The pygmy rabbit has been petitioned for listing under the ESA and is managed as a sensitive species throughout the project area. Pygmy rabbits are sagebrush obligates whose primary habitat includes tall, dense stands of big sagebrush with loose soils for burrowing. Bradfield (1974), Flath and Rauscher (1995), and Katzner and Parker (1997) have observed pygmy rabbit tracks in snow at distances between 262 and 328 feet or more from burrows. Spring and summer home ranges are larger than winter home ranges (Burak, 2006). Pygmy rabbits breed between February and May (Keinath and McGee, 2004). Females may have up to three litters per year and construct natal burrows which can be located outside of their core home range (Rachlow *et al*., 2005; Burak, 2006). Suitable habitat for the rabbit is present along much of the pipeline route.

Ruby conducted pygmy rabbit surveys in 2008 and 2009. Areas surveyed in 2009 included areas where pygmy rabbits were observed in 2008, where suitable habitat had yet to be surveyed, or where new project facilities were identified since the 2008 surveys. Field crews documented pygmy rabbit sightings, pellets, burrows, and the active status of the pygmy rabbit burrows/area. Eighty-three pygmy rabbit areas were observed in Wyoming, Utah, and Nevada in 2009. Table 4.7.3-3 summarizes the number, size, density, and active status of the pygmy rabbit areas identified in 2009.

TABLE 4.7.3-3

Pygmy Rabbit Observations Along the Ruby Pipeline Project

State	Number of Delineated Burrow Complexes	Number of Burrows	Total Area Delineated (acres)	Status
Wyoming	24	164	12	19 Currently Active 5 Recently Active
Utah	19	417	25.5	All Currently Active
Nevada	34	784	24.8	19 Currently Active 13 Recently Active 2 Historically Active
Oregon	0	0	0	-

Pygmy rabbits are highly mobile, and it is unlikely that a large number of individuals would be killed by construction equipment or related traffic, although some individual vehicle/rabbit collisions may occur. Some rabbits could remain in a burrow and be killed by trenching or burrow collapse. Pygmy rabbits could also be displaced if burrows are destroyed or filled in. Pygmy rabbits generally spend much

of their lives within 400 to 800 feet of their burrows. Construction could displace pygmy rabbits inhabiting the right-of-way from their primary home range.

Pygmy rabbits could also be impacted through removal of suitable habitat. Pygmy rabbits are susceptible to predation in areas with little shrub cover (Keinath and McGee, 2004), and substantial shrub cover would not be present on the right-of-way in many areas for several years or decades following construction. Consequently, the right-of-way could create a barrier to pygmy rabbit movement until revegetation is similar to adjacent conditions. To minimize impacts on pygmy rabbit habitat, Ruby has agreed to several conservation measures. Ruby's proposed measures are included in Appendix M and summarized below:

- realign the pipeline or construction workspace to avoid disturbance within 100 feet of active pygmy rabbit burrows, where possible;
- seed high rates of the appropriate subspecies of sagebrush throughout the habitat; and
- cut or mow sagebrush where full right-of-way grading is not required.

Where the pipeline or construction workspaces cannot be realigned to avoid disturbance within 100 feet of active pygmy rabbit burrows, Ruby would restore disturbed areas by creating shrub patches. Ruby has committed to avoiding identified breeding areas from February to March. The BLM Salt Lake Field Office may require this avoidance window to be extended through June in select areas.

One commenter on the draft EIS suggested that pygmy rabbit burrows could be flooded by the discharge of hydrostatic test water. Several active burrows and one recently active burrow are within 0.25 mile of potential hydrostatic discharge locations (MPs 6, 41.4 to 41.6, 56.5 to 59, 260.9 to 261, and 275.8). In order to minimize the potential for flooding pygmy rabbit burrows, **we recommend that Ruby control the outflow of hydrostatic test water discharge structures to ensure that discharge water does not reach occupied pygmy rabbit burrows at MPs 6, 41.4 to 41.6, 56.5 to 59, 260.9 to 261, and 275.8.**

In the conservation plan referenced in the Cooperative Agreement (Appendix M), vegetation was quantified within a 10-mile buffer centered on the pipeline (*i.e.*, 5 miles on each side of the pipeline). Pygmy rabbits primarily use areas with sagebrush-steppe vegetation for their habitat. According to the BLM, there are 2,301,539 acres of sagebrush-steppe habitat available within the 10-mile buffer. For the Ruby pipeline, 12,601 acres (0.6 percent) of sagebrush steppe within the 10-mile buffer would be directly affected by construction, and 2,253 acres (0.1 percent) would be directly affected by operations. However, not all sagebrush steppe is suitable habitat for the pygmy rabbit. Ruby surveyed the 115-foot-wide pipeline corridor for pygmy rabbit habitat and only 61.9 acres along the right-of-way was determined to be suitable.

According to the FWS's 90-day Finding (FWS, 2005), no substantial scientific information documents the historical or current range of pygmy rabbits within sagebrush ecosystems. However, the petition to list the pygmy rabbit estimated that the species' historical range was 100 million acres and that populations may currently exist in portions of 7 to 8 million acres (FWS, 2005). Therefore, assuming that the current distribution of pygmy rabbits is approximately 7 million acres, the 61.9 acres of suitable pygmy rabbit habitat impacted by the pipeline would affect only 0.0008 percent of habitat across the species' range.

Impacts related to loss of habitat and disruption of pygmy rabbit behavior would occur in the immediate vicinity of the pipeline during construction and revegetation. However, these impacts would be relatively localized and short term, given the small proportion of available pygmy rabbit habitat that would be permanently impacted. Some residual impacts on pygmy rabbit habitat would continue until the

pipeline corridor is fully revegetated. The Habitat Evaluation Analysis indicates that in addition to avoiding or replacing the 61.9 acres of habitat, an additional 53.8 acres of habitat should be enhanced or protected to offset the impacts of project activities.

Ruby has committed dedicated funding for the purposes of completing greater sage-grouse and pygmy rabbit conservation measures identified in the conservation plan in Appendix M. These proposed conservation actions and a list of projects that would contribute to restoring vegetation and reducing the threat of habitat fragmentation are presented in section 4.7.3.1. Implementation of the conservation measures and the pygmy rabbit conservation agreement and plan would result in reduced impacts on pygmy rabbit habitat. The implementation of conservation projects in the landscape around the pipeline corridor could have long-term beneficial impacts on pygmy rabbits and other sage obligate species that would extend beyond the life of the Ruby project. Although the Ruby project might impact the pygmy rabbit, it would not cause population-level effects nor lead to a trend toward federal listing, given the implementation of the Agreement and associated plan, the relatively small disturbance of sage habitat (when compared to its availability in Wyoming, Utah, Nevada, and Oregon), adherence to BLM timing and spatial stipulations, and the requirement for pipeline revegetation and restoration.

4.7.3.4 White-Tailed Prairie Dog

The white-tailed prairie dog was petitioned for ESA listing in 2002. The original petition was found by the FWS to not warrant listing. However, subsequent legal challenges to the original finding resulted in a FWS determination that the white-tailed prairie dog status would undergo additional review to determine if the species warranted ESA protection. The FWS's decision on whether to list the white-tailed prairie dog is expected in June 2010. The white-tailed prairie dog is considered a BLM sensitive species in the Kemmerer and Salt Lake Field Office planning areas and also is a WGFD species of concern.

White-tailed prairie dogs live in colonies and inhabit dry, flat, open grasslands with low, relatively sparse vegetation, including areas overgrazed by cattle. Fine-to-medium textured soils are preferred, presumably because burrows and other structures tend to retain their shape and strength better than in coarse, loose soils. White-tailed prairie dogs typically live at higher elevations and in meadows with more diverse grass and herb cover than do black-tailed prairie dogs.

The effects of construction through a white-tailed prairie dog colony include temporary loss of forage and shelter due to vegetation clearing, collapsing of burrows, and temporary disruption of foraging and nesting activities due to disturbance associated with construction equipment. Direct mortality of white-tailed prairie dogs could result if active burrows are occupied at the time of construction. If construction occurs later in the white-tailed prairie dog's reproductive season, in late May to early June, most white-tailed prairie dogs are expected to be mobile and able to avoid construction traffic; however, some individual white-tailed prairie dogs may be injured or killed during construction. In addition, there is potential for destroying active dens with young, depending on construction timing. Following construction and restoration, the revegetated right-of-way would provide foraging habitat for white-tailed prairie dogs, and the unconsolidated soils along the trench would likely provide a good substrate for burrowing.

Ruby conducted white-tailed prairie dog surveys in 2009. The results of these surveys are discussed in the black-footed ferret discussion in section 4.7.2.1. To limit construction-related impacts on those white-tailed prairie dog colonies within the construction right-of-way, **we recommend that Ruby modify the right-of-way configuration (*e.g.*, use the opposite side of the right-of-way to operate vehicle traffic) or reduce the construction right-of-way width to 75 feet where crossing known colonies to avoid white-tailed prairie dog burrows to the greatest extent possible. In addition,**

where a colony only occurs along the edge of the construction right-of-way, the colony edge should be flagged or exclusion fencing should be erected to avoid impacts on burrows. In accordance with condition 4 on section 5.2, Ruby would be required to identify these right-of-way modifications on its construction alignment sheets filed prior to construction for review and written approval by the Director of OEP.

Our recommendation would ensure that Ruby implement construction techniques to minimize impacts on white-tailed prairie dogs. We believe that the project may impact individuals but is not likely to cause a trend toward federal listing or cause population-level effects.

4.7.3.5 Northern Leatherside Chub

The northern leatherside chub has been petitioned for listing under the ESA. This species is restricted to the upper Snake and Bear River drainages, where it inhabits rocky, low-velocity runs and pools in creeks and small to intermediate rivers. The northern leatherside chub is present in Salt Creek, Bear River, and some of their tributaries. The Ruby Pipeline Project would cross three ephemeral or intermittent tributaries to Salt Creek, none of which appear to support northern leatherside chub. The project would also cross channels and canals associated with the Bear River near MP 52.9 and Woodruff Creek, a perennial tributary to the Bear River, near MP 60.8. The northern leatherside chub could be present in these waterbodies. Ruby has stated it would cross waterbodies that could contain sensitive species using a dry-crossing method. This method would reduce impacts on the leatherside chub when compared to using traditional wet open-cut crossing methods.

As stated in section 4.3.2.5, Ruby intends to appropriate 7,157,349 gallons (22 acre-feet) of water from Woodruff Creek for hydrostatic testing of the pipeline and dust control. We have recommended in section 4.3.2.5 that water withdrawal rates do not exceed 10 percent of a waterbody's base flow at the time of construction. By incorporating the mitigation measures discussed in section 4.7.1 and our recommendation in section 4.3.2.5, we conclude that while the project might impact individual northern leatherside chub, it would not cause population-level effects, nor lead to a trend toward federal listing.

4.7.3.6 Columbia Spotted Frog

The Great Basin subpopulation of the Columbia spotted frog (eastern Oregon, southwestern Idaho, and northern Nevada) is listed as a federal candidate species. Another subpopulation, in southwestern Wyoming, is a BLM sensitive species and is not a federal candidate species, and is not evaluated in this section. Suitable habitat for the Columbia spotted frog includes springs, seeps, meadows, marshes, ponds, streams, and other areas where there is abundant mesic vegetation at elevations between 5,600 and 8,700 feet above mean sea level. Columbia spotted frogs often migrate along riparian corridors; through adjacent uplands; and between spring breeding, summer foraging and winter hibernation habitats. The species has declined due to wetland and riparian degradation, drought, fire, and dam and road construction.

Ruby consulted with state wildlife agencies and heritage programs to identify areas along the proposed route that could support the Columbia spotted frog. Through consultations with NDOW, it was determined that Columbia spotted frog surveys should be conducted within three watersheds (South Fork Owyhee, Upper Humboldt, and North Fork Humboldt) in Elko County, Nevada from MPs 283 to R357. The ODFW recommended that Columbia spotted frog surveys should be conducted within the Warner Basin from MP 579 to 610. Qualified biologists conducted surveys at all project areas within the four watershed basins that contained wetlands, ponds, seeps, springs, ditches, or perennial streams crossings. Surveyed project areas included the pipeline right-of-way (including route variations that were adopted since the issuance of the draft EIS), extra workspaces, proposed access roads, and miscellaneous yards.

The biologists were trained by NDOW prior to conducting surveys and used Visual Encounter Surveys adapted from protocols employed by NDOW and other agencies (Toiyabe Spotted Frog Technical Team, 2004). In addition to the focused surveys for the Columbia spotted frog, field biologists performing general biological surveys during 2008 and 2009 were instructed to document all wildlife observed over the entire project, with special attention to sensitive species like Columbia spotted frogs.

Ruby did not observe Columbia spotted frogs during species-specific surveys in Elko County. However, a Columbia spotted frog was documented during general environmental surveys of proposed access roads. This frog was recorded at Rattlesnake Creek near its confluence with Willow Creek. This area lies outside of the focused survey area that was determined through consultation with NDOW. An NDOW biologist performed follow-up surveys in this area and discovered 75 juveniles at this stream crossing. He also documented a juvenile in a downstream portion of Willow Creek, upstream from the Willow Creek Reservoir. The biologist described these as new records for that area. The streams were relatively slow-moving and pooled, and the frogs appeared to be persisting.

In the Warner Basin, Columbia spotted frogs were recorded in three locations. One individual was observed in a seep near Surveyor Spring, and two other individuals were recorded in or near Deep Creek near the northeast edge of Big Valley. At Deep Creek, one individual was detected near an access road and another individual was detected along the banks of Deep Creek.

As stated in section 4.3.3.2 and 4.4.3, we have recommended that Ruby limit the construction right-of-way to 75 feet in wetlands and woody riparian habitats and locate extra workspaces outside wetlands and woody riparian habitats to minimize impacts on these habitats. Ruby has proposed to implement several construction and conservation measures to minimize impacts on Columbia spotted frog habitat, including restoring waterbodies and wetlands to their preconstruction condition, restoring trees and shrubs at woody riparian areas and wetlands, installing trench plugs to maintain wetland hydrology characteristics, and preventing the spread of weeds and treating weed infestations should they occur after construction. These measures would minimize Columbia spotted frog habitat impacts and facilitate successful restoration. We conclude that while the project might impact individual Columbia spotted frogs, it would not cause population-level effects, nor lead to a trend toward federal listing.

4.7.3.7 Northern Leopard Frog

The northern leopard frog has been petitioned for listing under the ESA. The northern leopard frog historically ranged from Newfoundland and southern Quebec, south to West Virginia, and west across the Canadian provinces and the western United States (Rorabaugh, 2005). However, since the 1970s the northern leopard frog has experienced significant declines throughout its range, particularly in the western United States and Canada (Corn and Fogelman, 1984). The species tends to become less abundant the further west within its range. The northern leopard frog is now considered uncommon in a large portion of its range in the western United States (Rorabaugh, 2005).

The northern leopard frog requires a mosaic of habitats (*i.e.,* overwintering, breeding, and upland post-breeding habitats) as well as habitat linkages to meet the requirements of all of its life stages (Pope *et al.,* 2000). Northern leopard frogs breed in slow-moving or still water along streams, rivers, wetlands, permanent or temporary pools, beaver ponds, and human-constructed habitats such as earthen stock tanks and borrow pits (Rorabaugh, 2005). Adult northern leopard frogs require stream, pond, lake, and river habitats for overwintering and upland habitats adjacent to these areas for summer feeding. In summer, adults and juveniles commonly feed in open or semi-open wet meadows and fields with shorter vegetation, usually near the margins of waterbodies, and seek escape cover underwater. During winter, northern leopard frogs are found inactive underwater on the bottom of deeper streams or waters that do not freeze to the bottom and are well-oxygenated (Stewart *et al.*, 2004).

The measures discussed in section 4.7.3.6 would likewise minimize impacts on northern leopard frog habitat. We conclude that while the project might impact individual northern leopard frogs, it would not cause population-level effects, nor lead to a trend toward federal listing.

4.7.4 Sensitive and State-Listed Species

Ruby identified 374 sensitive BLM, USFS, or state-listed species that could occur in the project area. Species with potential to occur on or near the proposed route were determined through discussions with BLM, USFS, and state agencies, and through review of state heritage databases and literature. Appendix U presents each of these species, their agency status, general habitat requirements, habitat association, and likelihood of occurrence. A more comprehensive description of each species' habitat needs and life history was presented in Ruby's FERC Certificate application. Our analysis incorporates relevant sections of Ruby's application through reference and tiers upon its descriptions. We eliminated 159 of these species from further consideration due to lack of suitable habitat in the project area or a species' restricted range that would not coincide with the project's area of impact. The remaining 215 species are discussed in this section.

Most impacts on special status species are a function of the type of habitat disturbed (habitat association), the length of time necessary for important habitat characteristics to be restored, a species' mobility, a species' dependence on specific habitat features, or a species' disturbance tolerance. We have organized our discussion of the project's impacts on sensitive and state-listed species according to habitat association. We then considered impacts on groups of species within a habitat association according to the remaining four criteria. This method has been used to address a variety of species' requirements within regional habitats, evaluate potential impacts on those species, and develop best management practices to reduce impacts (Barrows *et al.,* 2005). We identified habitat associations through a review of species' habitat requirements in combination with published data regarding species' habitat associations in the Great Basin (Wisdom *et al.,* 2005). Generalist species were placed in the habitat association they would be most likely to inhabit in those portions of the project where they are listed by the BLM, USFS, or state agencies. We used the vegetation cover types crossed by the proposed project as the basis for available habitat.

4.7.4.1 Sagebrush Steppe Habitat Association

The sagebrush steppe habitat association is the most common habitat type crossed by the project and occurs in all four states. This association is dominated by big sagebrush, primarily Wyoming big sagebrush and basin big sagebrush subspecies. Areas dominated by the larger basin big sagebrush often provide nesting habitat for sagebrush-dependent birds such as sage thrasher. Areas dominated by Wyoming big sagebrush, and to a lesser extent low sagebrush or black sagebrush, provide breeding, nesting, and foraging habitat for sagebrush-dependent species such as greater sage-grouse, and more generalist species such as ferruginous hawk. Sagebrush understories are typically interspersed with native perennial grasses, forbs, and other sub-dominant shrubs. Introduced annual grasses and forbs, primarily cheatgrass, have invaded many areas within this habitat association and decreased habitat quality and value for special status species.

Construction would result in significant losses of sagebrush habitat (see section 4.4.1.1). Revegetation studies on a pipeline right-of-way in northeastern California indicated that approximately 50 percent of the right-of-way supported shrubs with similar characteristics to adjacent undisturbed areas within 8 years (WESTECH, 2004). But other information suggests sagebrush revegetation could take as long as 50 years or more, depending on site-specific conditions. Species within this habitat association would be unable to fully use portions of the disturbed construction right-of-way for several years.

Table 4.7.4-1 summarizes classes of species common to this habitat association, the total number of sensitive species that inhabit this habitat, and the number of sensitive species with a high likelihood of occurrence within sagebrush habitats.

TABLE 4.7.4-1

Summary of Sensitive and State-Listed Species Associated with Sagebrush Steppe Habitat Along the Ruby Pipeline Project

Number	Bird	Mammal	Amphibian/ Reptile	Invertebrate	Vascular Plant	Nonvascular Plant	Affected Acreage
Total	9	6	2	1	21	0	12,601
High Likelihood of Occurrence	9	1	2	0	5	0	-

4.7.4.2 Grassland Habitat Association

This habitat association occurs primarily in Uinta County, Wyoming, and Rich, Cache, and Box Elder counties, Utah. Native perennial grasses are the typical dominants but may be replaced by cheatgrass in some areas. Shrubs are often lacking in grassland habitats. Grasslands provide habitat for special status species such as long-billed curlew, sharp-tailed grouse, and grasshopper sparrow. Grasslands along the project often occur at higher elevations and on deeper soils than do shrub-dominated communities. Herbaceous habitats with deeper soils typically revegetate quickly after construction. Revegetation studies on a pipeline right-of-way in Montana found that about 91 percent of native grassland habitats (about 98 miles) were similar to adjacent conditions within 5 years (WESTECH, 2001b). Table 4.7.4-2 summarizes classes of species within this habitat association, the total number of species, and the number of species with a high likelihood of occurrence.

TABLE 4.7.4-2

Summary of Sensitive and State-Listed Species Associated with Grassland Habitat Along the Ruby Pipeline Project

Number	Bird	Mammal	Amphibian/ Reptile	Invertebrate	Vascular Plant	Nonvascular Plant	Affected Acreage
Total	9	2	0	0	4	1	1,334
High Likelihood of Occurrence	7	1	0	0	0	0	-

4.7.4.3 Salt Desert Scrub Habitat Association

The salt desert scrub habitat association occurs in Wyoming, Utah, and Nevada and is dominated by desert shrubs including shadscale, Gardner's saltbush, greasewood, winterfat, and a variety of other shrub species. Perennial grasses are often limited, forbs may be common, and invasive annual grasses and forbs are frequently present. Salt desert scrub areas that are dominated by low-growing shrubs such as Gardner's saltbush can provide habitat for special status species such as burrowing owl, white-tailed prairie dog, and mountain plover.

Impacts on salt desert scrub habitats would be similar to those in sagebrush steppe since disturbances in shrub habitat typically require moderate to long time frames to resemble adjacent conditions. Pipeline disturbances within shadscale and salt desert scrub playa communities often require very long time periods to resemble adjacent habitats (WESTECH, 1999). In contrast, pipeline

disturbances within many Gardner's saltbush communities may recover more quickly (*e.g.,* within 5 to 10 years) (WESTECH, 1998). Table 4.7.4-3 summarizes classes of species within the salt desert scrub habitat association, the total number of species, and the number of species with a high likelihood of occurrence.

TABLE 4.7.4-3

Summary of Sensitive and State-Listed Species Associated with Salt Desert Scrub Habitat Along the Ruby Pipeline Project

Number	Bird	Mammal	Amphibian/ Reptile	Invertebrate	Vascular Plant	Nonvascular Plant	Affected Acreage
Total	2	4	0	3	17	0	3,444
High Likelihood of Occurrence	2	1	0	0	4	0	-

4.7.4.4 Mixed Conifer Forest Habitat Association

This habitat association includes areas dominated by ponderosa pine, various species of fir, western juniper, and occasional stands of aspen. The forest understory is frequently dominated by native shrubs and forbs, and grasses are often present in sparse stands. Mixed conifer forest occurs on the project route primarily in Lake and Klamath counties, Oregon. Minor amounts of mixed conifer forest occur at high elevations within Cache and Box Elder counties, Utah. Special status species included in this habitat association include several species of bats, woodpeckers, and owls.

Mixed conifer forests impacted by the project would require decades to revegetate and resemble adjacent conditions. Further, trees would not be allowed to reestablish within the 50-foot operational corridor along the pipeline right-of-way. However, revegetation studies along a pipeline right-of-way in ponderosa pine forests of northeastern California indicate that herbaceous and shrub species typically reestablish well within 5 to 8 years (WESTECH, 2004). Ruby has committed to replanting trees in forested areas disturbed by the project according to Oregon reforestation rules (OAR 629-610-0000 through 629-610-0090), BLM management direction, and USFS standards and guidelines. Table 4.7.4-4 summarizes classes of species within the mixed conifer habitat association, the total number of species, and the number of species with a high likelihood of occurrence.

TABLE 4.7.4-4

Summary of Sensitive and State-Listed Species Associated with Mixed Conifer Forest Habitat Along the Ruby Pipeline Project

Number	Bird	Mammal	Amphibian/ Reptile	Invertebrate	Vascular Plant	Nonvascular Plant	Fungi	Affected Acreage
Total	11	10	0	2	10	0	1	1,391
High Likelihood of Occurrence	8	2	0	1	4	0	0	-

4.7.4.5 Wetland Habitat Association

The wetland habitat association occurs as scattered pockets of habitat within surrounding upland areas. Wetlands occur throughout the project area along springs, streams, ponds, and rivers that are most common in Lake and Klamath counties, Oregon, and Box Elder County, Utah. Most wetlands are dominated by herbaceous vegetation although some shrub and forested wetlands would also be

encountered. Several special status species are associated with wetlands including herpetofauna (*e.g.*, salamanders and frogs), invertebrates, birds, and vascular plants. Pipeline impacts on wetlands in arid ecoregions that would be crossed by the project could be long-term. Approximately two-thirds of monitored wetlands in arid ecoregions failed to meet our restoration criteria after several years (FERC, 2004). However, many wetlands disturbed by non-FERC-related projects within these ecoregions also failed to meet criteria indicating that climactic rather than construction factors influenced success. Grade restoration and unauthorized vehicle use contributed to restoration failure in these and other ecoregions. The number of sensitive and state species that would be encountered within the wetland habitat association and the number of species with a high likelihood of occurrence are summarized in table 4.7.4-5.

TABLE 4.7.4-5

Summary of Sensitive and State-Listed Species Associated with Wetland Habitat Along the Ruby Pipeline Project

Number	Bird	Mammal	Amphibian/ Reptile	Invertebrate	Vascular Plant	Nonvascular Plant	Affected Acreage
Total	22	1	7	10	14	4	198
High Likelihood of Occurrence	6	0	1	3	2	0	-

4.7.4.6 Juniper Woodland Habitat Association

Juniper woodland occurs primarily in Box Elder County, Utah; Elko County, Nevada; and Lake County, Oregon. Western and Utah juniper are the dominant species in this habitat and are accompanied by an understory of native shrubs and sparse forbs and grasses. Cheatgrass and introduced annual forbs can also be significant understory components. Relatively few special status species utilize juniper woodlands within the project area. Pipeline impacts within juniper woodlands would be similar to those within the mixed conifer habitat association, as junipers would require decades to achieve similar characteristics to adjacent undisturbed areas. Revegetation monitoring within juniper woodlands on a right-of-way in northeastern California and northwestern Nevada indicated that juniper understory components typically resemble adjacent conditions within 5 to 10 years, although trees require decades to appear similar to adjacent habitats (WESTECH, 2004). Ruby would replant trees on forested federal lands disturbed by the project. Table 4.7.4-6 summarizes classes of species within the juniper woodland habitat association, the total number of species, and the number of species with a high likelihood of occurrence.

TABLE 4.7.4-6

Summary of Sensitive and State-Listed Species Associated with Juniper Woodland Habitat Along the Ruby Pipeline Project

Number	Bird	Mammal	Amphibian/ Reptile	Invertebrate	Vascular Plant	Nonvascular Plant	Affected Acreage
Total	3	2	0	0	6	0	413
High Likelihood of Occurrence	2	2	0	0	2	0	-

4.7.4.7 Riparian Habitat Association

Riparian habitat occurs in limited, isolated areas along streams, rivers, and other water features crossed by the project. Ruby has identified 17 riparian habitat locations within Utah, Nevada, and

Oregon. Riparian areas are typically dominated by cottonwoods, willows, and aspen with a shrub understory. Although riparian habitats are important habitat and travel corridors for many species, relatively few special status species within the project area are restricted to this habitat association. Similar to other woodland types, pipeline impacts would be relatively long-term, although water availability would likely increase the speed and success of restoration. Ruby has committed to restoring trees and shrubs in affected riparian areas and would limit maintenance clearing within 25 feet of a stream bank, thereby protecting some of the restored woody vegetation. We have also recommended that Ruby limit its construction right-of-way width to 75 feet and avoid locating extra workspaces within woody riparian habitats. The total number of species within the riparian habitat association and the number of species with a high likelihood of occurrence are summarized in table 4.7.4-7.

TABLE 4.7.4-7

Summary of Sensitive and State-Listed Species Associated with Riparian Habitat Along the Ruby Pipeline Project

Number	Bird	Mammal	Amphibian/ Reptile	Invertebrate	Vascular Plant	Nonvascular Plant	Affected Acreage
Total	3	3	0	0	0	2	369
High Likelihood of Occurrence	3	1	0	0	0	0	-

4.7.4.8 Coldwater Fishery Habitat Association

Coldwater fishery habitat is present at a relatively limited number of waterbodies crossed by the project. These waterbodies typically occur at relatively high elevations, have fast-flowing water, and have a cobble or gravel substrate. Various trout species are the primary special status fish within the coldwater fishery habitat association. Ruby identified 24 perennial waterbodies and 19 intermittent or ephemeral waterbodies that could support BLM or USFS sensitive or state-listed coldwater fish; several waterbodies also could support warmwater fish. Impacts on coldwater special status fish could occur as a result of sediment released during crossing procedures, hazardous material spills, channel movement, substrate alteration, and loss of riparian cover.

Ruby has committed to crossing waterbodies known to contain special status fish species using a dry crossing method. Dam-and-pump, flume, or similar methods would eliminate a substantial amount of sedimentation compared to open-cut procedures and have been shown to have minimal impact on stream morphology, fish habitat, and fish populations. Dry crossing techniques typically would not result in adverse stream bed modification or long-term negative effects to fish and benthic invertebrate populations, although shrub and tree stream bank cover could be reduced for several years (Reid *et al.,* 2002; Reid, 2000; Reid and Anderson, 1999; WESTECH, 1997). Ruby would implement its Spill Plan (Appendix J) to prevent storage or handling of material around waterbodies. Ruby would also abide by agency-specified in-water work windows to reduce impacts on fish and would replant tree and shrub riparian species. Six fish species were included in the coldwater fishery habitat association of which two (the inland redband trout and the Bonneville cutthroat trout) would have a high likelihood of occurring in the project area.

4.7.4.9 Warmwater Fishery Habitat Association

Warmwater fishery habitat is represented at several waterbodies crossed by the proposed project. These waterbodies often have relatively turbid slow-moving water, high sediment loads, and soft, unconsolidated bottoms comprised of sand or mud. Several species of sucker and chub are the primary special status warmwater fish in waterbodies that would be crossed. Ruby identified 18 perennial and 22

intermittent or ephemeral waterbodies that could support BLM sensitive or state-listed warmwater fish. Several waterbodies also support coldwater fish, primarily the Goose Lake population of inland redband trout. Impacts on warmwater special status fish could occur from the same activities that would cause impacts on coldwater fish. However, warmwater fish are typically more tolerant of higher sediment loads. Ruby would utilize dry crossing procedures at waterbodies that support warmwater special status species, construct during agency-specified in-water work windows, implement a Spill Plan to prevent impacts on waterbodies, and restore tree and shrub riparian species. Eight fish species were included in the warmwater fishery habitat association of which three (the Goose Lake lamprey, Goose Lake sucker, and Goose Lake tui chub) have a high likelihood of occurring in the project area.

4.7.4.10 Summary of Potential Impacts on Agency Sensitive and State-Listed Species

Potential impacts on agency sensitive and state-listed species may be greater than impacts on other vegetation and wildlife as these species may be more sensitive to disturbance, more specific to a habitat, and less able to move to unaffected suitable habitat, which may not be available (or currently exists only in small tracts). Disturbances could therefore have a greater impact on a species' population. Potential impacts that could be contrary to a species' conservation needs or decrease a population's viability include habitat fragmentation, habitat loss or degradation, operation and maintenance activities, and unauthorized use of the right-of-way.

Potential impacts and corresponding minimization or mitigation measures are often consistent within species' habitat associations. For example, removal of sagebrush could have similar effects to greater sage-grouse, pygmy rabbits, sage thrasher, and other sagebrush obligate species. Corresponding measures to minimize impacts on sagebrush, particularly within high-quality or important habitat, would often benefit several sagebrush associate species. Similarly, measures to minimize disturbance to riparian habitats would reduce impacts on all special status species within that habitat association.

Pipeline construction and operation could displace special status species or result in habitat degradation. Ruby has consulted with land managing and wildlife agencies to determine spatial buffers and construction timing restrictions that would minimize impacts around features such as raptor nests, greater sage-grouse leks, or stream crossings where special status fish are present. Ruby has also consulted with the NRCS and other agencies regarding revegetation mixtures. Successful revegetation would minimize long-term impacts on special status species by restoring habitat. Finally, Ruby has described best management practices (see section 4.7.1) that could be applied to minimize impacts on greater sage-grouse and pygmy rabbits. These best management practices would also reduce impacts on other species within the sagebrush steppe habitat association. Potential impacts on special status species are considered in light of these minimization measures.

Habitat fragmentation would be a potential impact associated with pipeline construction and other forms of disturbance. Fragmentation occurs when habitats are disturbed to such a degree that species are unable to move across the disturbance to reach adjacent habitats or are unable to complete typical life cycle functions such as breeding, foraging, or migration. The degree to which a disturbance would create habitat fragmentation is dependent on a variety of factors, such as size and configuration of the disturbance, height, and quality of post-construction land use, type and extent of wildlife use in the area, and the disturbance's influence on adjacent habitats. Fragmentation of low-quality or weedy habitat is typically not a concern since disturbances in these habitats are quickly colonized by the adjacent weed species, and special status species often do not use weedy habitats extensively.

Solitary pipeline rights-of-way are typically small disturbances relative to the surrounding landscape and compared to other development activities in the project areas such as mining and logging. The majority of the project landscape does not contain large contiguous tracts of shrub or forest land. For

instance, the proposed project would cross only 12 contiguous forest stands greater than 1 mile in length, the largest of which is 2.3 miles in length. Additionally, on November 13, 2008, the FWS commented that 95 percent of existing sagebrush habitat is located less than 1.6 miles from a mapped road. The project could create barriers for species with limited mobility or those with high fidelity to local habitats, such as reptiles, amphibians, or small mammals.

Ruby would revegetate and restore the pipeline right-of-way following construction. Any fragmentation effects would decrease as revegetation begins to resemble adjacent conditions. Based on this analysis, the primary elements of habitat fragmentation relative to the proposed project would be adequacy of reclamation, post-construction use of the right-of-way, and the location of aboveground facilities within important habitat. Successful restoration of the right-of-way would reduce the length of time that habitat may be fragmented for less-mobile special status species. Successful restoration also would ensure that habitat important to all special status species would not be lost or degraded. Limiting post-construction use of the right-of-way would ensure that the right-of-way does not become a conduit for unauthorized traffic or project traffic during critical wildlife seasons. Traffic on the right-of-way, especially extensive unauthorized use, would promote habitat fragmentation. Aboveground features within important habitat would encourage traffic within that habitat, and possibly additional light and noise.

4.7.4.11 Summary of Conservation Measures for Agency Sensitive and State-Listed Species

Ruby has described several procedures (see section 4.7.1) and developed several plans it would implement during project construction and reclamation to reduce habitat impacts and impacts on various species. Ruby is continuing to consult with state and land managing agencies to identify and develop conservation and mitigation measures that could be implemented to further minimize impacts on sensitive and state-listed species. The BLM and USFS would have further opportunity during their right-of-way grant review processes to require additional conservation and mitigation that would protect and conserve sensitive species according to their agency conservation goals.

Throughout this EIS, we have recommended additional construction practices, avoidance measures, and mitigation measures where we believe the project, as proposed, would not adequately support certain species' conservation needs or agency-recommended conservation measures; or where additional habitat data or species-specific surveys are necessary. We note that implementation of these recommendations would minimize impacts on habitat associations generally considered sensitive (*e.g.*, sagebrush, riparian, aquatic). Additionally, conservation plans are being developed between Ruby and various agencies to minimize construction-related impacts and mitigate for impacts on high-quality habitats. Thus, we believe that project-related impacts on special status species discussed in this section would be reduced to levels that would not threaten the population viability of agency sensitive or state-listed species, or contribute to trends toward federal listing.

4.7.5 Non-Jurisdictional Electric Power Lines

No federally listed threatened or endangered species were identified along the Rocky Mountain Power and Harney Electric Cooperative electric transmission and distribution line routes. However, biologists recorded six pygmy rabbit complexes (petitioned species) along the proposed Rocky Mountain Power route. Twenty-one burrows were counted within the complexes, seven burrows of which were not entirely intact (*e.g.*, enlarged by a predator). All other burrows entrances were usable and located at the bases of sagebrush shrubs. Twelve of the burrows had fresh pellets associated with them. The other nine burrows had older, gray pellets near their entrances.

As appropriate, Rocky Mountain Power would implement one or more of the following mitigation measures to minimize impacts on the pygmy rabbit:

- identify densely growing, large-stature sagebrush plants with deep, loamy soils;
- realign the H-frame structures to avoid appropriate habitat;
- neck-down the construction right-of-way through known, active rabbit colonies;
- trap and relocate pygmy rabbits if the area is unavoidable;
- use BMPs to rehabilitate disturbed soil and sagebrush steppe vegetation;
- haul topsoil off-site to keep the construction right-of-way narrow;
- plant container sagebrush and monitor sites for rabbit return and usage; and/or
- avoid identified breeding areas from February to March.

Should a listing of any current candidate and petitioned species be made before or during construction of these facilities, the BLM would be required to initiate Section 7 consultation for that species. Since these projects would be required to restore their respective construction rights-of-way and adhere to all applicable laws and regulations regarding special status species and habitats, we believe that impacts on special status species and their habitats along the Rocky Mountain Power and Harney Electric Cooperative electric transmission and distribution line routes would not be significant.

4.8 LAND USE AND VISUAL RESOURCES

The Ruby Pipeline Project would consist of approximately 672.6 miles of 42-inch-diameter natural gas pipeline across Wyoming, Utah, Nevada, and Oregon, and 2.6 miles of 42-inch-diameter lateral pipeline in Oregon. Aboveground facilities would include 4 new compressor stations, 8 interconnects within 5 meter stations, 44 MLVs, and 20 pig launchers and receivers (see table 2.1.2-1).

This section examines the land requirements for construction and operation of the project, describes the current use of those lands, and evaluates the significance of project-related impacts on those lands. This section quantifies the acreage of each land use type that would be affected and discusses measures that would be taken to avoid, minimize, or mitigate land use impacts. Impacts on recreational and special interest areas, as well as impacts on visual resources, are also presented.

In general, lands required for construction would experience either short-term or long-term impacts based on the time it would take the land to recover to preconstruction conditions; lands required for operation would experience permanent impacts. Short-term impacts generally occur during construction with the resource returning to preconstruction condition within 3 years following construction. Long-term impacts require anywhere from an estimated 3 to 50 years to return to preconstruction conditions. Both short- and long-term impacts are considered temporary impacts. Permanent impacts would occur as a result of activities that modify resources to the extent that they would not return to preconstruction conditions within 50 years, such as clearing of old growth forest or conversion of land to an aboveground facility site.

4.8.1 General Impacts and Mitigation

Five general land use types would be affected by the project: open land (including rangeland), agricultural, forest, developed (including residential, industrial, commercial, and other lands), and open water. Table 4.8.1-1 summarizes the acreage of each land use type that would be affected by construction and operation of the project.

TABLE 4.8.1-1

Land Use Types Affected by Construction and Operation of the Ruby Pipeline Project (in acres)

State/Project Component	Open Land		Forested		Agricultural		Developed		Open Water		Total	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
WYOMING												
Right-of-Way	645.5	282.2	5.6	2.8	9.7	5.1	6.0	2.4	-	-	666.7	292.5
Extra Workspaces and Staging Areas	133.5	-	1.5	-	1.5	-	7.0	-	-	-	143.5	0.0
Access Roads	324.5	-	3.5	-	1.9	-	3.1	-	-	-	333.0	0.0
Yards	118.1	-	-	-	19.5	-	2.7	-	-	-	140.3	0.0
Aboveground Facilities[a]	42.6	42.6	-	-	-	-	-	-	-	-	42.6	42.6
Subtotal	1,264.2	324.8	10.6	2.8	32.6	5.1	18.8	2.4	0.0	0.0.	1,326.2	335.2
UTAH												
Right-of-Way	1,724.6	751.5	304.6	137.4	284.8	126.9	229.4	103.6	1.2	0.5	2,544.6	1,12-
Extra Workspaces and Staging Areas	624.4	-	173.5	-	241.1	-	36.2	-	0.8	-	1,076.1	0.0
Access Roads	748.9	-	85.1	-	117.9	-	138.1	-	0.1	-	1,090.1	0.0
Yards	1-	-	0.2	-	97.7	-	8.1	-	-	-	115.9	0.0
Aboveground Facilities[a]	27.5	27.5	-	-	-	-	-	-	-	-	27.5	27.5
Subtotal	3,135.4	778.9	563.5	137.4	741.5	126.9	411.8	103.6	2.1	0.5	4,854.2	1,147.5
NEVADA												
Right-of-Way	5,509.2	2,107.3	25.3	10.0	71.2	28.5	47.6	17.8	0.0	0.0	5,653.2	2,163.6
Extra Workspaces and Staging Areas	1,305.3	-	12.3	-	13.8	-	26.9	-	-	-	1,358.4	0.0
Access Roads	1,383.1	-	5.0	-	6.4	-	12.7	-	-	-	1,407.2	0.0
Camp	154.9	-	2.4	-	-	-	3.7	-	-	-	161.0	0.0
Yards	483.1	-	-	-	-	-	60.1	-	-	-	543.1	0.0
Aboveground Facilities[a]	51.9	51.9	-	-	0.5	0.5	1.1	1.1	-	-	53.5	53.5
Subtotal	8,887.5	2,159.3	45.0	10.0	91.9	29.0	152.0	18.9	0.0	0.0	9,176.4	2,217.1
OREGON												
Right-of-Way	683.7	298.8	321.1	140.6	57.8	28.7	1.3	0.6	74.9	48.5	1,138.8	517.1
	0.1 ℓ	0.1 ℓ	- ℓ	- ℓ	34.7 ℓ	14.8 ℓ	2.1 ℓ	1.0 ℓ	- ℓ	- ℓ	36.9 ℓ	15.9 ℓ
Extra Workspaces and	217.6	-	174.9	-	41.3	-	1.2	-	118.4	-	553.4	-

TABLE 4.8.1-1

Land Use Types Affected by Construction and Operation of the Ruby Pipeline Project (in acres)

State/Project Component	Open Land		Forested		Agricultural		Developed		Open Water		Total	
	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.	Con.	Op.
Staging Areas												
	0.1 ℓ	-	-	-	3.3 ℓ	-	0.9 ℓ	-	-	-	4.2 ℓ	0.0 ℓ
Access Roads	154.2	-	145.6	-	3.2	-	0.2	-	-	-	303.3	0.0
Camp	5.4	-	-	-	6.7	-	-	-	-	-	12.1	0.0
Yards	45.1	-	-	-	30.4	-	22.3	-	-	-	97.8	0.0
Aboveground Facilities[a]	5.5	5.5	-	-	11.4	11.4	0.3	0.3	-	-	17.2	17.2
Subtotal	1,111.7	304.4	641.6	140.6	188.7	54.9	28.4	1.9	193.3	48.5	2,163.7	550.2
Total	14,398.8	3,567.4	1,260.8	290.8	1,054.7	215.9	610.9	126.7	195.4	49.0	17,520.5	4,249.9
ALL STATES/COMPONENTS												
Right-of-Way	8,563.0	3,733.2	656.7	292.2	423.4	193.2	284.2	126.8	76.1	49.0	10,003.4	4,394.4
	0.1 ℓ	0.1 ℓ	- ℓ	- ℓ	34.7 ℓ	14.8 ℓ	2.1 ℓ	1.0 ℓ	- ℓ	- ℓ	36.9 ℓ	15.9 ℓ
Extra Workspaces and Staging Areas	2,280.8	-	362.2	-	297.8	-	71.3	-	119.2	-	3,131.3	0.0
	0.1 ℓ	- ℓ	- ℓ	- ℓ	3.3 ℓ	- ℓ	0.9 ℓ	- ℓ	- ℓ	- ℓ	4.2 ℓ	0.0 ℓ
Access Roads	2,610.7	-	239.2	-	129.4	-	154.1	-	0.1	-	3,133.5	0.0
Yards and Camps	816.6	-	2.6	-	154.3	-	96.8	-	-	-	1,070.3	0.0
Aboveground Facilities[a]	127.5	127.5	-	-	11.9	11.9	1.4	1.4	-	-	140.8	140.8
Total	**14,398.8**	**3,860.8**	**1,260.8**	**292.2**	**1,054.7**	**219.9**	**610.9**	**129.2**	**195.4**	**49.0**	**17,520.5**	**4,551.1**

a Construction and operational impacts associated with MLV's are not presented under Aboveground Facilities. These impacts are included in the right-of-way impacts.

Con.= Impacts within the 115-foot-wide construction workspace that are related to construction activities.

Op.= Impacts within the 50-foot-wide permanent right-of-way of the mainline and lateral pipeline and the footprint of aboveground facilities. Ruby indicated that it would not need to maintain vegetation (*i.e.*, mow) within the 50-foot-wide permanent right-of-way in most land uses types. Additionally, Ruby indicated that most land use activities within the 50 foot-wide permanent right-of-way, such as farming and grazing, would be allowed to continue after construction. Certain activities, such as erecting a building or other permanent structures, would be prohibited within the permanent right-of-way.

Construction of the proposed project would affect a total of about 17,520.5 acres of land; including 14,398.8 acres of open land, 1,260.8 acres of forested land, 1,054.7 acres of agricultural land, 610.9 acres of developed land, and 195.4 acres of open water. Ruby would operate approximately 4,109.1 acres of pipeline right-of way and 140.8 acres of aboveground facility sites after construction. Ruby indicated that it would not need to maintain vegetation (*i.e.*, mow) within the 50-foot-wide permanent right-of-way in most land uses types, including open land, agricultural land, developed land, and open water. Permanent operation of Ruby's facilities would affect about 3,567.4 acres of open land, 290.8 acres of forested land, 215.9 acres of agricultural land, 126.7 acres of developed land, and 49.0 acres of open water. Construction of the pipeline would not change the general use of the land but would preclude construction of aboveground structures on the permanent right-of-way.

About 296.9 miles (44.0 percent) of the right-of-way would be collocated with (*i.e.*, overlap or abut) other existing road or utility rights-of-way, or would be parallel to and offset from other existing road or utility rights-of-way. Other existing utility rights-of-way include pipelines, electric power lines, and fiber optic cables. Table 4.8.1-2 and Appendix V list the locations where the construction right-of-way would be collocated with or parallel to other existing rights-of-way.

TABLE 4.8.1-2

Collocated and Parallel Rights-of-Way for the Ruby Pipeline Project

State/County		Utility Rights-of-Way (miles)	Road Rights-of-Way (miles)	Total (miles)
WYOMING				
Lincoln		15.3	0.1	15.4
Uinta		0	5	5
	Subtotal	**15.3**	**5.1**	**20.4**
UTAH				
Rich		12.6	0.3	12.9
Cache		10.2	0.8	11
Box Elder		20.3	46.4	66.7
	Subtotal	**43.1**	**47.5**	**90.6**
NEVADA				
Elko		121.2	0	121.2
Humboldt		23.1	9.2	32.3
Washoe		21.1	0	21.1
	Subtotal	**165.4**	**9.2**	**174.6**
OREGON				
Lake		0	2	2
Klamath		0.26	9	9.26
	Subtotal	**0.26**	**11**	**11.26**
	Total	**224.1**	**72.8**	**296.9**

Many of the access roads proposed by Ruby for use during construction are small or impassable two-tracks that are not currently suitable for construction traffic. Ruby is proposing to improve unsuitable access roads through grading, filling, and/or widening. About 582 roads totaling about 4,003.7 acres would need to be graded or widened up to a total road width of 30 feet, with extra width of up to 25 feet beyond the existing road edge at sharp turns. Additionally, Ruby would construct new roads where existing roads do not provide adequate access. A total of 3 new dirt and gravel roads totaling about 0.9 acres would be constructed up to 15 feet wide to accommodate timber clearing at various locations, to respond to a landowner request, and to gain access to an aboveground facility (a MLV at MP R109.0). Ruby presently does not know specifically where all road improvements would be required along any given road. This information would not be available until after Ruby's construction contractor identifies

which roads it prefers to use and how it prefers to use the roads. Therefore, for the purpose of this EIS we have conservatively estimated that all roads would need to be improved over their entire length. This undoubtedly is an overestimation. Appendix E identifies each new access road and each access road that would potentially require improvement.

Ruby has not determined the volumes or locations where gravel fill would be needed for road improvements or maintenance because the volumes and locations would not be known until Ruby assesses each road's use and to what extent weather conditions affect the road condition. Ruby estimates that less than 5 percent of the access road mileage would require some gravel for maintenance or improvement. To provide some perspective on the amount of gravel that may be needed, if Ruby were to place a 30-foot-wide, 6-inch-deep gravel cap across all 5 percent of the access road mileage needing some gravel for maintenance or improvement, about 160,150 cubic yards of gravel fill would be needed (about 16,015 10-yard dump truck loads). This too, however, is an overestimation and represents a worst-case scenario. Some access roads would only require placement of gravel at specific locations such as where potholes or ruts currently exist. Ruby indicated that it would seek gravel locally from existing commercial sand and gravel pits or other retailers. It would not establish its own pits for the project. The BLM notes that there are no commercial gravel sources available in western Box Elder County, Utah, and commercial gravel sources are limited in proximity to the rest of the route in the State of Utah.

Ruby originally proposed to leave access roads in their new or improved condition, unless otherwise requested by a landowner or land managing agency. We have reviewed Ruby's list of existing access roads and have concluded that many of the roads are primitive two-tracks that would require significant improvement for project purposes over much of their length. Many of these two-tracks are also on public land where access is intentionally limited or restricted. Improving and retaining two-tracks would, for all practical purposes, open up these areas to increased public use. Therefore, we discussed in the draft EIS the need for a directive that would require Ruby to restore all roads to their preconstruction condition unless the landowner or land managing agency requests in writing that a road be left in its improved condition. Since the time the draft EIS was issued, Ruby has agreed to restore all access roads to their preconstruction condition unless the landowner or land managing agency requests in writing that a road be left in its improved condition.

To date, some private landowners have indicated an interest in leaving roads in their improved condition, but are reserving the right to make that final decision until when they see the road's condition at or close to the end of construction. The BLM has indicated that all BLM-administered roads in Humboldt and Washoe Counties would be required to be restored to their preconstruction condition. In those instances, the BLM would require Ruby to close each road in accordance with the standards and land use plans of the BLM. Closure activities may include, but are not limited to, scarifying the roadway and revegetating the entire length and width of the road used by Ruby. The FERC and BLM acknowledge that closing and/or restoring roads could be very difficult in some cases. The FERC and BLM would require Ruby to implement corrective actions in problem areas in accordance with the measures discussed in section 2.3.1.9. In the event that, after several attempts, the FERC or BLM determines that restoration would be infeasible, Ruby would be required to compensate for damages. Landowners, land managing agencies, or road permitting agencies would be responsible for enforcing road closures after construction and final restoration.

Ruby has evaluated its need for access roads in California and determined that certain roads would be required to access portions of the project in Oregon. Ruby identified a total of 22.5 miles of access roads to be used in California, of which 5.9 miles would be roads on public lands and 16.6 miles would be roads on private lands. Ruby has stated it would not need to improve any of the roads in California and there would be no vegetative or soil disturbance associated with their use. Ruby would

obtain the necessary authorizations to use the roads from the BLM, USFS, Modoc County and landowners.

4.8.1.1 Open Land

The majority of the project (about 14,398.8 acres, or 82.2 percent of the project total) would cross undeveloped open land within the Great Basin. The Great Basin is a large, arid region of the western United States that is characterized by high altitude desert and an internal drainage system that has no natural outflow to the sea. Dominant open land vegetation communities include sagebrush steppe, grasslands, and salt-desert scrub. Much of the Great Basin area is managed for livestock grazing or wildlife habitat. Potential impacts on vegetation and wildlife are addressed in sections 4.4 and 4.5, respectively.

The proposed pipeline crosses numerous grazing allotments with different grazing systems, or pasture rotations. Construction would impact livestock grazing by disturbing foraging areas and interrupting/displacing grazing activities for the duration of construction. Construction activities could also cause damage to or require removal of fences or other natural barriers used for livestock control, could block access to water sources or other grazing areas, and could cause risk of livestock injury from falling in to or becoming entrapped in open trenches. Ruby would brace, cut, and temporarily gate fences during construction to contain livestock where appropriate. Ruby also would repair fences, install permanent gates (possibly with cattle guards in high traffic areas), and seed disturbed areas after construction in accordance with the specifications outlined in its Restoration and Revegetation Plans (see Appendix L).

In some situations, Ruby would mitigate grazing displacement by developing grazing plans that would align construction schedules with pasture grazing schedules and avoid overlapping time conflicts as much as practicable. In the event that cattle are unable to graze in scheduled or alternate areas during construction, Ruby would be required to compensate grazing allotment permittees.

We received comments during scoping and on the draft EIS regarding the potential for problematic revegetation after construction due to livestock grazing in reclaimed areas before vegetation has become established. Grazing can contribute to the rapid spread of weeds on western public lands, which can reduce habitat quality and accelerate natural fire cycles (Belsky *et.al*, 2000). Ruby is addressing this concern by committing to negotiate with allotment permittees and the BLM to limit livestock grazing in the right-of-way and on restored access roads, and by using a combination several approaches, including:

- leaving the restored right-of-way surface in a roughened condition;
- including low-palatable plant species in the seeding mix such as sagebrush and western yarrow that would discourage use by livestock;
- herding or placing salt licks and/or protein blocks 100 to 200 feet away from the right-of-way;
- fencing off crucial habitat areas or closing pastures;
- developing grazing deferment agreements for 2 to 3 years, or implementing seasonal deferments; and/or
- reducing stocking preference.

The BLM has stated that any changes requested of the livestock operations that are outside the terms and the conditions of the grazing permits (*i.e.*, using a pasture when it has should be rested, or vice versa) would require further NEPA analysis.

We also received comments from several parties regarding the potential for increased OHV use along the right-of-way, which could hamper revegetation efforts, cause erosion, and promote the spread of invasive weeds. Ruby stated that it would discuss OHV issues with landowners during easement negotiations. Ruby has committed to using the following deterrents, in consultation with the BLM, USFS, state resource agencies, and landowners, to discourage OHV use of the right-of-way:

- leave the right-of-way surface in a roughened condition;
- install "keep off" signs with an explanation at right-of-way entry points;
- install fences, gates with locks, rock barriers, earthen berms, or other barricades at existing authorized OHV routes that cross the right-of-way to prevent or discourage unauthorized access to the right-of-way; and
- in Oregon, construct "corn rows" for approximately 200 feet into the right-of-way from entry ways such as roads.

Ruby has agreed to work closely with the BLM and private landowners, grazing lessees, local law enforcement personnel, and adjacent landowners to determine the adequacy and appropriateness of proposed deterrents. Ruby would maintain, repair, or replace deterrent measures for the life of the pipeline. In the spring of 2010, the Fremont National Forest is expected to have its Travel Management Rule implemented, which would mean motor vehicle use would only be allowed on designated routes shown on a Motor Vehicle Use Map. Vehicle use off these routes would be prohibited.

4.8.1.2 Forested Land

About 1,260.8 acres of forested land (or 7.2 percent of the project total) would be crossed by the project, mostly within the Cache National Forest in Cache County, Utah and the Fremont National Forest in Lake and Klamath counties, Oregon. The Cache National Forest contains a mixture of oak and coniferous trees of varying density. The Fremont National Forest consists primarily of pines and firs.

Pipeline installation would require that the construction work area be cleared of trees and shrubs. Trees and shrubs would be allowed to regenerate after construction in temporarily disturbed areas. Trees and shrubs within the 50-foot-wide permanent right-of-way would be periodically cleared during routine right-of-way maintenance. Ruby would be required to replant and monitor forested areas temporarily disturbed by construction in accordance with BLM management directions, USFS standards and guidelines, and State of Oregon reforestation rules. The rate of forest regrowth would depend on the type and age of trees cleared for construction, the fertility of the soil, and the local rainfall amount. Many tree species would require decades to grow to maturity, which is a long-term impact. Ruby would be required to continue monitoring revegetation success as required by any right-of-way grant issued for the project.

4.8.1.3 Agricultural Land

About 1,054.7 acres of agricultural land (or 6.0 percent of the project total) would be crossed by the project, the majority of which is in Box Elder County, Utah and Lake County, Oregon. Typical row crops in Box Elder County include wheat, barley, and corn; specialty crops include peaches, apricots, cherries, and apples (Utah State University, 2005). The project does not cross any State of Utah-designated Agricultural Protection Areas. Typical crops in Lake County include potatoes, wheat, and alfalfa.

Impacts on agricultural land would include the loss of standing crops within the construction work area and the disruption of farming operations in the construction vicinity during the growing season

in the year of construction. Pipeline installation would take agricultural land out of production for one growing season for row crops and for several growing seasons for specialty crops. Agricultural land, including the permanent right-of-way, would be allowed to revert to its former use after completion of construction activities, representing a short-term impact. Ruby would compensate agricultural landowners for actual crop losses resulting from the removal of standing crops, disruption of planned seeding activity, disruption of general farming activities, or other losses as agreed upon in individual landowner easement negotiations. Ruby also would compensate landowners for any crop reductions related to pipeline construction (both on and off the right-of-way) and would base such payments on landowner farming records from the previous 5-year average. Ruby would conduct post-construction monitoring to gauge revegetation success within affected agricultural areas, and restoration would be considered successful if crop yields were similar to adjacent undisturbed portions of the same field.

As described in section 2.3.1.9, we recognize that during or after construction, issues or complaints may develop that were not addressed during the environmental proceedings at the Commission and it is imperative that landowners continue to have an avenue to contact Ruby's representatives. Section 5.2 includes a complaint resolution procedure we are recommending that would require Ruby to ensure landowner issues and complaints received during and after construction are resolved in a timely and efficient manner.

Construction-related activities such as grading, trenching, stringing, welding, backfilling, and restoration could impact agricultural lands by leading to soil erosion, interference with and/or damage to agricultural surface and sub-surface drainage and irrigation systems, loss of fertile topsoil through mixing with subsoil, and soil compaction. Ruby would implement measures in its Plan (Appendix F) designed to control erosion (*e.g.,* installation of slope breakers and sediment barriers) during construction activities.

Several commenters informed us that cropland could be equipped with tile drainage systems that remove excess subsurface water and/or manage irrigation water. Construction activities such as trenching could have the potential to damage these systems. Ruby has worked with individual landowners to identify and avoid drain tiles on individual properties. Ruby has determined that the only drain tiles affected by the project would occur between MPs 112.0 and 119.0 near Corrine, Utah (about 10 separate drain tile crossings within the milepost range). Drain tile locations would be marked prior to construction and the pipeline would be installed in a manner similar to other utility crossings (see section 2.3.2.4). Ruby has agreed to mark the locations of all unanticipated drain tiles encountered during construction and would the repair the drain tiles to preconstruction conditions or better. Ruby would maintain records of all drain tiles encountered during construction.

Portions of the project would cross areas where crop irrigation practices may be used (*e.g.,* pivot irrigation or flood irrigation). Ruby committed to contact landowners prior to construction to coordinate construction timing in relation to irrigation activities. Ruby would repair any damage to irrigation systems to preconstruction conditions or better and would compensate farmers for damage to crops, reduced crop yield, or loss of irrigation opportunity.

We received several comments regarding the potential for construction to adversely affect precision-leveled fields. Precision leveling aids irrigation and surface drainage efforts as well as other farm management activities. Construction activities could change the surface topography and could result in the need to relevel cropland using laser leveling equipment. Ruby stated that it would coordinate construction with owners of precision-leveled fields and would arrange for local experts to relevel affected areas using precision-leveling techniques during restoration activities. In order for us to verify that landowners' precision-leveled field issues are being met, **we recommend that Ruby file with its quarterly reports (as specified in Ruby's Plan, section VII.B.2) details discussing whether any**

complaints were received concerning the restoration of the precision-leveled fields crossed by the project and how each was resolved.

We received several comments regarding the potential for post-construction soil subsidence in the trench to interfere with flood irrigation or the movement of pivot irrigation equipment. Interference with irrigation could result in the loss of crops or reduced crop yields. Ruby has committed to compact the trench during backfilling in irrigated cropland to minimize the likelihood of subsequent trench subsidence and disruption to equipment movement or water flow. Compaction involves backfilling the trench to the top of the pipe and saturating the trench with water to compact the soil around the pipe. Successive layers of soil are compacted in this manner, or by mechanical means if necessary, until the trench is completely backfilled. Ruby stated that it would work with each affected landowner to restore the original grade in the event that subsidence occurs.

We received comments that expressed concern regarding whether the pipeline would be buried to a sufficient depth so as to not interfere with current agricultural practices. Ruby stated that the depth of cover over the pipeline would be established from the working grade during restoration, meaning that in active agricultural areas the depth of cover would exceed 30 inches once segregated topsoil had been restored. Ruby reiterated its commitment to install the pipeline deeper where requested by landowners. While burying the pipeline deeper may be advantageous in certain areas, based on specific land use or soil characteristics, it often requires a wider right-of-way to accommodate the extra spoil removed from the trench. In our draft EIS, we recommended that prior to the close of the draft EIS comment period Ruby notify by letter correspondence each agricultural landowner whose actively cultivated or rotated cropland and/or pasture property would be crossed by the project, offering the option of additional depth of cover over the pipeline. Ruby has filed documentation showing that it is offering this option to agricultural landowners; this would ensure that concerns related to insufficient cover depth in agricultural lands are addressed.

4.8.1.4 Developed Land

Developed land is one of the least common land use types that would be crossed by the project (about 610.9 acres, or 3.5 percent of the project total). Development in the project area generally consists of roads and single-family residences associated with agricultural lands. The project would not cross or otherwise impact commercial and industrial developments. Residences near the proposed pipeline route are generally concentrated in and around Woodruff and Brigham City, Utah, and Langell Valley and Malin, Oregon. Residential yards and lawns would be impacted by construction, although no buildings (residential or otherwise) are known to be present within 50 feet of any proposed construction work areas.

General impacts of construction and operation on residential acreage would result from construction-related disturbances, including future use limitations on land within the permanent pipeline right-of-way and potential alteration of future development patterns. Construction-related disturbances could include inconvenience caused by limited access, increased congestion, noise and dust generated by construction, local increase in traffic, and removal of objects stored in the construction work area (*e.g.*, trailers, wood piles). These effects would be short-term in nature and would last only a few weeks at any particular location. Most current uses of the residentially developed land crossed would be allowed continue within the permanent right-of-way following construction. However, land in the permanent right-of-way would be subject to some future use restrictions, typically regarding structures and other uses that could affect the safe operation of the pipeline.

We received comments noting that the project could interfere with future planned property development. Affected landowners have the opportunity to request that future development plans for their property be considered during easement negotiations and that specific measures be undertaken to

account for those plans. Ruby also contacted planning and development offices in each of the counties crossed by the project to determine if any residential and/or commercial developments were planned within 0.25 mile of the project. Planned development projects include those that are permitted and not yet constructed, or those with permit applications that have been filed but have not yet been approved. Ruby identified two such residential developments and one electric power line project within 0.25 mile of the pipeline route. These development projects are in the early stages of planning.

The first such planned residential development, Flat Bottom Canyon, would be located between MPs 104.5 and 105.3 near Brigham City. Brigham City recently annexed land within Flat Bottom Canyon for a new residential community; however, preliminary information suggests that there would not be a conflict between the pipeline route and the development. The project developer has not yet filed a master plan with the Brigham City Planning and Zoning office. Ruby reiterated its commitment to continue to communicate with the developer and city/county officials regarding the pipeline route and construction schedule.

The second residential development, Skyline Terrace, would be located between MPs 107.0 and 107.2 near Brigham City. The pipeline would pass through a portion of the proposed development. The project developer has filed a preliminary design for the development with the Brigham City Planning and Zoning office; however, the city has not yet responded to the design. Ruby initiated preliminary negotiations with the developer to acquire an easement and identify potential conflicts, if any. Ruby stated that it would continue to negotiate with the developer and communicate with city/county officials regarding the pipeline route and construction schedule.

Rocky Mountain Power has proposed to construct two 345-kilovolt electric power lines parallel to the pipeline route between MPs 105.7 and 108.5, near Brigham City. The electric power lines would be routed about 100 feet north of the pipeline. We do not know Rocky Mountain Power's construction schedule at this time. Ruby would work with Rocky Mountain Power to coordinate construction activities should the projects' schedules overlap.

4.8.1.5 Open Water

Open water is the least common land use crossed by the Ruby Pipeline Project (about 195.4 acres, or 1.1 percent of the project total). The project would cross 117 perennial waterbodies, livestock watering ponds/lakes, numerous intermittent or ephemeral drainages and washes, canals, and ditches. Pipeline construction at waterbody crossings would be in accordance with all federal and state regulations and permit requirements, and Ruby would minimize impacts by following its Procedures. Installation of the pipeline would have only temporary impacts on waterbodies. A detailed discussion of impacts on water and water resources is discussed in section 4.3.2.

4.8.2 Land Ownership

The Ruby Pipeline Project would cross both public and private lands (see table 4.8.2-1). The majority of the federal land that would be crossed is administered by the BLM. The USFS and Reclamation also manage land crossed by the proposed project. No tribally-owned or reservation[6] land would be crossed.

[6] Although no tribally-owned or reservation land would be crossed by the proposed project, several tribes have noted that the project could disrupt lands of traditional tribal significance and cultural importance.

TABLE 4.8.2-1

Federal and Private Lands Crossed by the Ruby Pipeline Project

State/County	MP Range	BLM [a] (miles)	USFS [a] (miles)	Recl.[a] (miles)	State (miles)	Private (miles)	**Total (miles)**	Federal (%)	State (%)	Private (%)
WYOMING										
Lincoln	0.0 - 21.1	9.2	--	--	0.6	11.4	**21.2**	43	3	54
Uinta	21.1 - 48.1	11.2	--	--	1.0	14.8	**27.0**	41	4	55
	Subtotal	**20.4**	**0.0**	**0.0**	**1.6**	**26.1**	**48.1**	**42**	**3**	**54**
UTAH										
Rich	48.1 - 73.1	9.8	--	--	1.0	14.2	**25.0**	39	4	57
Cache	73.1 - 101.0	--	1.2	--	--	26.7	**27.9**	4	0	96
Box Elder	101.0 - 230.6	38.9	--	--	9.7	81	**129.6**	30	7	63
	Subtotal	**48.7**	**1.2**	**0.0**	**10.7**	**121.9**	**182.5**	**27**	**6**	**67**
NEVADA										
Elko	230.6 - R396.7	86.5	--	--	--	79.6	**166.1**	52	0	48
Humboldt	R396.7 - 536.0	106.9	--	--	--	32.4	**139.3**	77	0	23
Washoe	536.0 - 588.2	47.1	--	--	--	5.1	**52.2**	90	0	10
	Subtotal	**240.5**	**0.0**	**0.0**	**0.0**	**117.1**	**357.6**	**67**	**0**	**33**
OREGON										
Lake	588.2 - R647.3	5.5	13.1	--	--	40.5	**59.1**	31	0	69
Klamath	R647.3 - R672.6	5.3	3.7	3.5	--	12.8	**25.3**	49	0	51
	0.0 $_{\ell}$ - 2.6 $_{\ell}$	--	--	--	--	2.6	**2.6**	0	0	100
	Subtotal	**10.8**	**16.8**	**3.5**	**0.0**	**55.9**	**87.0**	**36**	**0**	**64**
	Total	**320.4**	**18.0**	**3.5**	**12.3**	**321.0**	**675.2**	**51**	**2**	**48**

a Classified as federal land.

4.8.2.1 Federal Lands

The pipeline would cross about 342 miles of federal lands (about 50.6 percent of the project total). Eighteen of the 44 aboveground facility sites would be located on federal lands, including the Roberson Creek Compressor Station at MP 5.7, a portion of the Wildcat Hills Compressor Station at MP 172.5, and the Desert Valley Compressor Station at MP 476.3. Federal lands generally are managed for a variety of purposes that are primarily related to preservation, recreation, and development of natural resources. Ruby would be required to obtain a right-of-way grant from the BLM to construct and operate its pipeline and its aboveground facilities on federal land. The BLM is responsible for issuing right-of-way grants for natural gas pipelines across federal lands under the jurisdiction of the BLM or under the jurisdiction of two or more federal agencies. Right-of-way grants are issued under the MLA to any qualified individual, business, or government entity. The BLM would decide whether or not to issue Ruby a right-of-way grant to cross BLM-, Reclamation-, and USFS-managed land based, in part, on this EIS; however, the BLM would not issue a right-of-way grant until the heads of the BLM, Reclamation, and USFS had concurred on a mutually agreeable action. If the affected agency heads were not able to reach concurrence, the Secretary of the Interior, after consultation with the agency heads would decide whether or not to issue a right-of-way grant to Ruby. Section 28 of the MLA states, in part that "A right-of-way through a federal reservation shall not be granted if the Secretary or agency head determines that it would be inconsistent with the purposes of the reservation." Right-of-way grants are typically issued for a 30-year period and contain a right of renewal if the permitted facilities are still used for their intended purpose upon expiration of the grant period. Where federally administered facilities with an easement are crossed, Ruby would be required to execute a consent document directly with the managing agency (*e.g.*, Reclamation, FWS, NRCS) to allow for pipeline facilities to encroach in the easement.

Many federal agencies are mandated by law to prepare land use plans for land managed under their jurisdiction; and all agency actions, including issuance of permits or approvals, must conform to the land use plans. An action must be specifically allowed in the plan for the action to remain in conformance. If an action is not specifically mentioned in the plan, the land managing agency must make a determination that the action is consistent with the plan because it complies with all of the plan stipulations, constraints, standards, and guidelines, or the plan must be amended to accommodate the action. Section 1.5 provides a discussion of the project's conformance with various land use plans along the project route.

BLM Land

BLM-administered land would comprise 47.5 percent of the entire route and 93.7 percent of all federal land crossed by the project. The BLM manages federal lands for multiple uses including recreation, wildlife, livestock grazing, and mineral resources. The pipeline would cross land managed by seven separate BLM field offices: Kemmerer, Wyoming; Salt Lake City, Utah; Elko and Winnemucca, Nevada; Surprise, California (which manages lands in northwest Nevada); and Lakeview and Klamath, Oregon. Ruby filed a right-of-way grant application with the BLM in 2007. Ruby would be required to follow all stipulations contained in any right-of-way grant issued for the project.

USFS Land

The USFS manages 155 National Forests and 20 national grasslands for grazing, timber, mining, recreation, wildlife habitat, and wilderness. USFS-administered land would comprise 5.3 percent of all federal land crossed by the project. The pipeline would cross 1.2 miles of the Cache National Forest in Cache County, Utah and 16.8 miles of the Fremont National Forest in Lake and Klamath counties, Oregon.

While the USFS requires that pipelines follow designated utility corridors, Ruby's proposed route within the Cache National Forest does not consistently follow designated utility corridors. Therefore, the USFS is using this EIS to consider amendments to the Cache National Forest LRMP to allow the pipeline to cross the forest as proposed.

The project as proposed also would be inconsistent with a number of standards and guidelines in the Fremont National Forest LRMP. Specifically, the pipeline would pass through portions of Management Areas 6 – Scenic; 14 – Old Growth; and 15 – Fish and Wildlife Habitat and Water Quality; Soil Capability Areas 1, 2, and 3; and scabland portions of Capability Area 13. The Fremont National Forest LRMP would need to be amended to allow construction to occur (see section 1.5.3). LRMP amendments would need to include allowance for additional time to attain VQOs (see section 4.8.4), relocation or addition of dedicated old growth, allowance of heavy equipment operation through seeps and springs, and a specific exemption of the project from the LRMP's detrimental soil and erosion standards and guidelines. The Fremont National Forest reviewed access routes needed for the construction of the pipeline. None of the proposed improvements would impact Inventoried Roadless Areas. The pipeline would cross just north of the Crane Mountain Inventoried Roadless Area; however, no roads that require improvement for access to the pipeline cross through this Inventoried Roadless Area. Therefore, the USFS is using this EIS to consider amendments to the Fremont National Forest LRMP to allow the pipeline to cross as proposed.

The USFS noted that the pipeline route would depart from the WWEC as it passes through the Fremont National Forest. See section 3.4.9 for background information and a description of the WWEC. Applications for energy projects both within and outside of the WWEC continue to be subject to normal

environmental review under applicable statutes. As proposed, Ruby's pipeline route would avoid mule deer winter range and bald eagle nesting habitat crossed by the WWEC west of Goose Lake.

Reclamation Land

Ruby's initial proposed route crossed three canals and drainages administered by Reclamation's Klamath Basin Area Office. Since its initial proposal, Ruby modified its route in the area for various environmental reasons (see section 3.4.15). Ruby's current proposed route avoids all three of Reclamation's canal facilities. However, it crosses the Lost River at approximate MP R665.2, where Reclamation owns the easement on the southwest side of the Malone Reservoir. Reclamation would require that all waterbodies under its jurisdiction be crossed outside of the irrigation season (generally October 15 to March 15). Since the Lost River is under Reclamation's jurisdiction, Ruby would be required to conform with Reclamation's site-specific crossing methods, including their *Engineering and O&M Guidelines for Crossings*.

The pipeline route also crosses approximately 3.5 miles of land owned and controlled by Reclamation from MPs R661.4 to R664.8. Reclamation-administered land comprises less than 1 percent of all federal land crossed by the project. Reclamation has expressed concern about minimizing OHV use along the pipeline right-of-way after construction. Reclamation states that the pipeline route crosses its lands in a remote area where unauthorized OHV use has been an issue in a similar setting. Ruby would implement the OHV mitigation measures described in sections 2.3.1.7, 4.8.1.1, in Ruby's Plan (see Appendix F), and in Ruby's Restoration and Revegetation Plans (see Appendix L). Ruby would install OHV barriers at appropriate locations in coordination with Reclamation. Ruby would submit designs for OHV barriers to Reclamation for review and approval. OHV barriers could include soil/rock berms, log barriers, vegetative screens, signs, fencing, and locked gates. Ruby would monitor and maintain OHV barrier effectiveness throughout the life of the project. Ruby would coordinate development of the construction mitigation measures with Reclamation, and Reclamation would incorporate measures into the right-of-way grant to ensure that construction and restoration would be completed in compliance with Reclamation standards (Reclamation, 2008).

FWS Land

The proposed pipeline route extends approximately 1.0 to 1.5 miles south of Sheldon NWR between MPs 516 and 543. The Sheldon NWR is managed by the FWS, and its primary goal for the refuge is wildlife conservation. The Sheldon NWR was established in 1931 with the following specific goals: provide habitat for pronghorn antelope (primary species) as well as mule deer, greater sage-grouse, and song birds; conserve threatened and endangered species; and provide a migratory bird sanctuary (FWS, 2009b). While the pipeline would not enter the Sheldon NWR boundaries, Ruby is proposing to use several roads within the Sheldon NWR for right-of-way access (Ruby's original route crossed one parcel of the Sheldon NWR at approximately MP 539, but Ruby has since filed a route realignment which moves the pipeline route south to avoid entering the Sheldon NWR (see section 2.1.1)). With the exception of Nevada State Highway 140, the FWS has full jurisdiction over all roads and other travel routes within the Sheldon NWR. The Nevada DOT has a right-of-way for Highway 140, which grants it authority to allow highway-related uses.

The FWS has expressed concern throughout scoping and during the comment period on the draft EIS regarding the potential impacts from the project's use of access roads within the Sheldon NWR. The FWS has expressed particular concern regarding the use of primitive two-tracks used for the occasional passage of Sheldon NWR personnel or other authorized four-wheel-drive vehicles.

Ruby proposes to use 10 access roads and other travel routes located on and around the Sheldon NWR. Four of the roads provide primary access into and out of the Sheldon NWR, including Nevada State Route (SR) 140 and CRs 8A, 34, and 34a. Ruby is proposing to use and improve six smaller roads along the southern portion of the Sheldon NWR that would require substantial improvements and upgrades so they could be used by heavy construction-related vehicles. The FWS noted that these roads are maintained for and primarily used by FWS staff responsible for NWR management and members of the public visiting the NWR to participate in allowable public uses (*e.g.*, hunting, fishing, and wildlife observation and photography).

Consistent with relevant law and policy, the FWS would be required to complete several regulatory analyses to determine whether Ruby's use and improvement of the aforementioned access roads could be found appropriate or determined compatible with the goals of the Sheldon NWR. These analyses would include use of the data and evaluations contained within this EIS, in addition to the FWS' data and data provided by Ruby. If Ruby's proposal to use access roads on the NWR is determined compatible, the FWS would then authorize the roads for the proposed uses and improvements, as appropriate. The FWS would also prepare and issue a ROD for these federal decisions.

Other Federal Land

Although not federally owned, land under conservation agreements with the FSA also is crossed by the proposed pipeline route. The FSA manages federal lands under a variety of conservation and easement programs, including the CRP. The CRP provides technical and financial assistance to eligible farmers and ranchers to address soil, water, and related natural resource concerns on their lands in an environmentally beneficial and cost-effective manner. The program also provides federal, state, and tribal environmental compliance assistance to farmers and ranchers and encourages environmental enhancement on enrolled lands. The CRP is administered by the FSA. The NRCS provides assistance with technical land eligibility determinations, conservation planning, and practice implementation.

The project crosses about 5 miles of land enrolled in the CRP near MP 140.0. Ruby would be required to restore these areas in accordance with the landowners' easements with the NRCS and ensure that all CRP requirements are met after construction. A more detailed discussion on potential effects to CRP land is presented in sections 4.4.4.

4.8.2.2 State Lands

The pipeline crosses about 12.3 miles (about 1.8 percent of the project total) of state-owned lands (1.6 miles in Wyoming and 10.7 miles in Utah). Two of the 44 aboveground facility sites are on state-owned land, including the Wildcat Hills Compressor Station at MP 172.5, which also is partially on federal land. None of the state-owned lands crossed by the project are within designated state forests or parks. Most of the land was granted to the states by the federal government for the support of public schools and other beneficiary institutions. The states manage the lands for a variety of uses, including oil and gas exploration, alternative energy production, coal and gravel mining, and forestry and timber harvesting; or the land is leased to private tenants for farming or livestock grazing. Other state-owned lands are managed for additional purposes, such as for wildlife habitat, recreational uses, or scenic beauty. In Utah, the UDWR is authorized to "enter into cooperative agreements and programs with other state agencies, federal agencies, states, educational institutions, municipalities, counties, corporations, organized clubs, landowners, associations, and individuals for purposes of wildlife conservation (Utah Code 23-22-1)." The UDWR is the wildlife authority for Utah, and is appointed as the trustee and custodian of protected wildlife (Utah Code 23-14-1). Ruby would acquire the necessary permits and approvals for construction across all state-owned lands.

East Fork of the Little Bear River and Salt Creek Wildlife Management Areas

Within the state land crossed in Utah, two crossings occur on lands designated as WMAs. These two land parcels are managed by the UDWR and were acquired by the state for habitat conservation with federal aid funding from the FWS. The pipeline would cross the East Fork of the Little Bear River WMA (East Fork WMA) southeast of Avon in Cache County between MPs 91.8 and 92.6. The pipeline also would cross the Salt Creek WMA in Box Elder County between MPs 123.1 and 123.4.

The East Fork of Little Bear and Salt Creek WMAs were purchased by the UDWR with Wildlife Restoration Act grant funds administered by the FWS's Division of Wildlife and Sport Fish Restoration. Before pipeline construction easements can be granted on these WMAs, UDWR is required to obtain the approval of the Regional Director, Region 6, FWS through grant amendments.

Since these properties were purchased with Wildlife and Sport Fish Restoration acts funding, any proposed uses or impacts on the properties must be evaluated to determine if the use materially interferes with or detracts substantially from the approved purposes of each WMA. The intent of this evaluation is to keep the properties "whole" or unaffected from the proposed use such that the property continues to uphold the wildlife and resource functions and values for which it was acquired.

East Fork WMA

The purpose of the East Fork WMA is to preserve aquatic habitat and to provide public access. A perennial stream, the East Fork of the Little Bear River, crosses this land parcel and it supports a Bonneville cutthroat trout fishery. The riparian areas and forested hillsides support a wide variety of neo-tropical songbirds. The East Fork WMA also is within designated crucial winter range for mule deer. We received comments during scoping regarding the potential for impacts on this area, which is a popular hiking, biking, fly fishing, bird watching, and camping area.

The East Fork WMA is approximately 234 acres in size and is composed primarily of mountain meadow and mountain meadow/shrub vegetation. The Ruby pipeline would linearly bisect the East Fork WMA for approximately 0.7 to 1.0 miles and approximately 11.2 acres of the WMA would be affected by the project (comprising mountain meadow, mountain meadow/shrub, and riparian vegetation). The extent and juxtaposition of these habitat types to each other is not common in the area and this uniqueness provides for increased value of the property for neo-tropical migrant songbirds, raptors, and other wildlife species.

Ruby conducted special status plant, raptor, other bird, and mammal surveys along the pipeline corridor in this area. No special status species were identified. The proposed pipeline route does cross the East Fork of the Little Bear River at a point approximately 500 feet west of the boundary of the East Fork WMA at approximate MP 92.7. The pipeline would run along the river floodplain between MPs 92.0 and 92.6 on the north side of the river. At two locations the construction workspace would be within 10 feet of the river's edge. As required in Ruby's Procedures and discussed in section 4.3.2.4, Ruby submitted site-specific construction plans and an extra workspace table (Appendix E) that identifies extra workspaces and staging areas in and within 50 feet of waterbodies (in this case the East Fork of the Little Bear River). We have reviewed the plans and extra workspace table and have determined that Ruby has not provided sufficient site-specific justification to allow us at this time to approve Ruby's use of extra workspaces and staging areas in or within 50 feet of this river.

The impacts are associated with the pipeline corridor right-of-way itself, along with adjacent temporary workspaces, an equipment staging area, and a permanent MLV site. After the pipeline centerline was staked, UDWR biologists met on-site with Ruby personnel to walk the alignment and

"micro-adjust" the centerline to minimize and avoid impacts on sensitive habitats and resources. Although this movement of the alignment was somewhat successful in protecting resources, some resources were either unable to be avoided or there was insufficient room to provide an adequate buffer to protect sensitive resources. The result is that there would be some permanent habitat impacts on resources on the East Fork WMA that would affect the wildlife functions and values for which the property was acquired.

These impacts have not been quantitatively identified; however, the following impacts are predicted to occur on the property:

- Direct/Permanent Loss of Tree/Shrub habitats: The pipeline right-of-way would be graded and cleared of all tree and shrub vegetation. The majority of the right-of-way would be permanently kept free of tree and shrub vegetation. This would result in the loss of semi-mature riparian and mature mountain shrub/tree habitats that would take decades to recover to their existing condition, if they are allowed to re-establish at all. On the western portion of the property, the right-of-way would cut through an old oxbow of the East Fork of the Little Bear River. This area supports a forested wetland habitat, a large portion of which would be permanently lost. In two locations, the pipeline right-of-way would be within 5 or 10 feet of the top of the East Fork of the Little Bear River streambank, which would result in the loss of the riparian vegetation.

- Direct Loss of Mountain Meadow habitat: The establishment of the mainline valve would result in the permanent loss of a small area of mountain meadow grassland habitat.

- Temporal Loss of Habitats: Since the pipeline right-of-way would be reseeded with a grass/forb mixture, the mountain meadow grassland habitat community should quickly return to pre-existing conditions. In other areas of the right-of-way where trees and shrubs would be allowed to re-establish, the vegetation components should be established within 5 to 10 years. However, some of these areas would not achieve their pre-existing conditions for more than 20 years.

- Temporal Loss of Recreation Opportunities: The East Fork WMA is unusual in Cache County in that it provides relatively undisturbed and quiet public access to lowland riparian habitat. During the 3 to 4 months during the spring and summer of 2010 when the property would be disturbed by grading and pipeline installation activities, it would be essentially "unavailable" physically or aesthetically for most recreation opportunities. The parking lot would be used by Ruby for equipment storage, and heavy equipment would be working on the north side of the river (noise, workers, dust, *etc*.). During the time Ruby is present on-site, recreationists would be deterred from using the property.

Recreational use in the East Fork WMA occurs year-round but use is higher in the fishing season between spring and fall (when construction is likely to occur). Construction impacts would include limiting or precluding access for recreational users during construction and a short-term loss of habitat along the East Fork of the Little Bear River, which would diminish the aesthetic appeal of the area. Ruby has coordinated with the UDWR to site the locations and width of the construction workspace in this area to minimize impacts on the river, associated wetlands, and adjacent riparian and forested areas.

During construction, Ruby would provide signage for closed areas, would redirect traffic, and if appropriate, would post flaggers to direct motorists. As described in section 4.5.2, Ruby would implement several mitigation measures to protect big game winter ranges, including scheduling

construction to avoid crucial big game winter range time periods, leaving trench cross-over breaks at 0.5-mile intervals, leaving a 10-foot gap in soil stockpiles for wildlife movement, and installing trench ramps to allow tramp wildlife to escape.

La Plata Road, located in the southwestern portion of the East Fork WMA, would be utilized as an access road. A disturbed grassland area located between La Plata Road and the pipeline, currently used as a visitor parking lot, would be used by Ruby as a staging area and parking lot. Ruby also proposes to construct an MLV immediately northwest of the staging area. This MLV site would require some permanent aboveground piping and would be contained within a 50-foot by 75-foot fence.

After construction, Ruby would restore the contours of the affected area and reclaim and replant the riparian habitat. Rather than reseeding the riparian areas, Ruby would replant these areas with more mature trees and shrubs (2 to 5 years in age) to reduce the overall time required to reach preconstruction conditions. At the end of the reclamation phase of the project, all recreation activities would be able to resume to normal levels on the right-of-way, with the exception of the footprint of the MLV.

Salt Creek WMA

The Salt Creek WMA is a 5,254-acre area of land located north of the Great Salt Lake and 6 miles south of Tremonton, Utah. The Salt Creek WMA was established to preserve waterfowl habitat and provide access for public hunting. The pipeline crosses a southern extension the Salt Creek WMA and would affect about 7.4 acres of land that contains sagebrush steppe vegetation. The closest wetland areas occurs approximately 2,000 feet to the north of the pipeline. Ruby conducted special status plant, raptor, other bird, and mammal surveys along the pipeline corridor in this area. No special status species were identified.

Recreational use of the Salt Creek WMA includes year-round bird watching from only select gravel roads and at one designated viewing site, and waterfowl hunting during the appropriate season, during which time camping is allowed. Construction traffic and noise would temporarily affect recreational uses of the Salt Creek WMA by interrupting access and disrupting bird activity; however, this would be a short-term impact of 2 to 3 months and would occur only when construction is active on or near this particular parcel. Ruby would provide road signage and, if necessary, traffic flaggers to maintain open access to parking areas and wildlife viewing areas.

The impacts would be associated with the pipeline right-of-way itself as no temporary work spaces or staging areas have been identified for the property. This area, while it can support wildlife species associated with sagebrush steppe communities, is located adjacent to several roads and a landfill, and, as such, has a reduced wildlife value.

- Direct Loss of Habitat: Since Ruby would allow shrub vegetation to re-establish on the pipeline right-of-way, this community should eventually return to pre-existing conditions.

- Temporal Loss of Habitat: Sagebrush communities can take many years to recover and regeneration in this area may take 30 to 50 years or more to fully recover. Given this long rate of recovery of sagebrush communities, UDWR considers this a permanent impact on wildlife habitat.

We received a comment on the draft EIS questioning the potential implications of the use of the East Fork WMA and Salt Creek WMA lands for a pipeline corridor. The commenter was concerned that the pipeline could possibly conflict with the terms of the FWS grant that were decided during the creation of the management areas. For any lands identified as state-owned lands and bound under contract with

the FWS for habitat conservation, Ruby would be required to obtain rights-of-way from the State of Utah. The existing contracts between the UDWR and FWS would require amendments for a change in purpose and would precede the State of Utah issuing any rights-of-way across such lands. Specific details of the impacts as a result of the change in purpose and mitigation measures proposed must be clearly stated. This is typically done through an Environmental Assessment (EA) or EIS such as this.

UDWR Granting of Right-of-Way Easements

Prior to granting easements for the Ruby pipeline, the FWS would review and evaluate the proposed impacts on each WMA and discern how the properties may be materially affected by the project and the values protected. Upon completion of this process, the FWS can approve grant amendments for easements crossing each WMA.

These grant amendments would serve to legally grant the conditioned right-of-way to Ruby for the pipeline. UDWR would work with Ruby and the FWS to identify potential special conditions with the intent of fully protecting the wildlife functions and values for which the properties were acquired.

To ensure that Ruby completes its discussions with the UDWR to develop any special conditions for easements on the WMAs and receive the FWS grant amendments for the UDWR easements, **we recommend that Ruby continue to work with UDWR and FWS to ensure all project impacts on the East Fork and Salt Creek WMAs' resources are fully addressed via development of a WMA Impact Management and Mitigation Plan.**

4.8.2.3 Private Lands

The proposed project route crosses about 321.0 miles of private lands (about 47.5 percent of the project total). Twenty-four of the 44 aboveground facility sites are sited on private lands, including the Wieland Flat Compressor Station at MP 330.1. Ruby would secure easements to convey both temporary (for construction) and permanent (for operation) rights-of-way on private lands. The easement acquisition process is designed to provide fair compensation to the landowners for the pipeline company's right to use the property for pipeline construction and operation. Ruby would compensate landowners for loss of value to specific parcels. The easement agreement between the company and landowner typically specifies compensation for loss of use during construction, loss of nonrenewable or other resources, damage to property during construction, and limits on use of the permanent right-of-way after construction. Landowners have the opportunity to request that site-specific factors and/or development plans for their property be considered during easement negotiations, and that specific measures be taken into account. Other than the easement, construction of the pipeline would not place any restrictions on a landowner's ability to sell or transfer ownership of a property during or after construction.

Ruby could use the right of eminent domain granted to it under Section 7(h) of the NGA to obtain right-of-way and temporary work areas in the event that an easement could not be negotiated and the project is certificated by the FERC. In this case, Ruby still would be required to compensate the landowner for the right-of-way and for any damages incurred during construction; however, the level of compensation would be determined by the court. Eminent domain does not apply to land under federal ownership or management.

4.8.3 Recreation and Special Interest Areas

In addition to the recreational interests associated with the two state of Utah WMAs described in section 4.8.2.2, the Ruby Pipeline Project would cross several other recreation and special interest areas, including two National Trails, one proposed WSR, and three byways. The project as proposed would not

cross any NWR land; however it would involve the use of several access roads on the Sheldon NWR. The project would not cross any National Wildlife Management Areas, National Park or Monument lands, National Forest campgrounds, Wilderness Areas, WSAs, Inventoried Roadless Areas, or NCAs. However, the project would be close to some special interest or recreation areas including one National Forest campground, one BLM campground, federal wilderness areas including the Black Rock NCA, the Black Rock Desert Wilderness, and the Massacre Rim WSA; and the recreational area where the Burning Man Festival is held annually. The project may result in some indirect effects to these nearby areas. The project is not within 0.25 mile of a sensitive receptor (*i.e.*, church, school, cemetery, or hospital), 100-year flood plain, or Coastal Zone Management Area.

4.8.3.1 National Forest Campgrounds

The proposed project does not cross any National Forest campgrounds, but is in close proximity to the Monte Cristo Campground within the Cache National Forest. The proposed route crosses immediately north of and adjacent to about 3.3 miles of the northern boundary of the Cache National Forest between MPs 71.7 and 75.0. The project passes within about 800 feet of the closest loop of campground campsites at MP 73.3. The Monte Cristo Campground has 45 single campsites and 2 group areas, each of which hold between 80 and 100 people. The peak camping season is generally between July and November. Although construction would not directly affect designated campsites, campers would be inconvenienced by limited access, increased congestion, noise and dust, and impacts on vegetation, resulting in fewer opportunities for National Forest visitors to enjoy the facilities. These effects would be mostly short-term and limited to the duration of construction, except for effects to vegetation, which would require 1 year or more to reestablish. Ruby would coordinate development of the construction schedule and mitigation measures with the USFS, and the USFS would incorporate measures into the right-of-way grant to ensure that construction and restoration would be completed in compliance with USFS standards.

4.8.3.2 National Trails

The National Trail System Act of 1968 was established to designate and protect national scenic trails, national historic trails, and national recreational trails. The proposed centerline would cross two National Trails: the Oregon National Historic Trail and the Crane Mountain National Recreational Trail. Additionally, a segment of the Applegate-Lassen Trial, which is a component of the California National Historic Trail, is located on the southern edge of the Vya Construction Camp.

Oregon Trail

The Oregon National Historic Trail was once one of the main overland migration routes on the North American continent, and led from locations on the Missouri River westward to the Oregon Territory. Between 1841 and 1869 the Oregon Trail was used by settlers, ranchers, farmers, miners, and businessmen migrating to the Pacific Northwest. When the first transcontinental railroad was completed in 1869, the use of this trail by long distance travelers rapidly diminished. By 1883 the Northern Pacific Railroad had reached Portland, Oregon, and most of the reason for the trail disappeared. Roads were built over or near most of the trail as the local population traveled to cities originally established along the Oregon Trail.

The project would cross the Oregon National Historic Trail on the Bear River Divide Segment at about MP 20.0. This segment of the trail is administered by the BLM's Kemmerer Field Office. The BLM's RMP allows right-of-way crossings of historic trails if the following criteria are met: (1) construction must minimize surface destruction; (2) the crossing must be located in an area where trail ruts have been modified by modern use, alongside a previously existing crossing, or where the crossing

would not damage trail remains; (3) the crossing must avoid fragile trail resources; (4) the crossings should be made at a right angle to the trail and corridor unless it follows a previous crossing; (5) vegetative species indigenous to the protective corridor must be used to rehabilitate right-of-way surface disturbance; and (6) the disturbed area must be returned to a natural contour.

According to the National Parks Service Trails System Officer, the segment of the trail crossed by the proposed project has been previously determined to be a non-contributing portion of the property, and its setting does not convey the character of the trail's historic period due to the number of modern developments in the area (see section 4.10.1.1). Although trail traces are present in the vicinity, no physical evidence of the trail exists at the proposed pipeline crossing. Ruby designed the trial crossing to create a very weak contrast so that the trail's setting would not be adversely affected. Visual impacts are discussed further in section 4.8.4.6. Ruby also has coordinated with the BLM to ensure conformance with all RMP criteria for a trail crossing. The BLM would incorporate necessary measures into its right-of-way grant to ensure that construction and restoration would be completed in compliance with BLM standards.

Crane Mountain Trail

The Crane Mountain National Recreational Trail is 31 miles in length and connects into the Fremont National Recreation Trail at the South Fork Crooked Creek Trailhead. The Crane Mountain Trail offers travelers many scenic vistas and diverse environments as it traverses the slopes and summit of the rugged Crane Mountain. The trail is open to hikers, pack stock, and mountain bikes for its entire length, and motorized use is permitted on an 8-mile segment of the trail. The proposed project crosses the trail at about MP 610 within the Fremont National Forest near Rogger Meadow.

Construction across the Crane Mountain National Recreational Trail would result in temporary, short-term closure to the portion of the trail located within Ruby's construction right-of-way. Ruby has coordinated with the USFS to develop a construction plan that would minimize impacts on the trail and its recreational users. Ruby would coordinate trail closure with the USFS and would post notices 30 days prior to construction that explains the reason for closure of the trail and describes a temporary access or detour around the construction site. Ruby would construct a trail detour along the edge of the construction site during trail closure to provide hikers safe access around the construction site. Signs would be posted 100 feet up and down the trail from the construction site to warn hikers of the construction and associated detour ahead. The USFS would incorporate measures into the right-of-way grant to ensure that construction and restoration is completed in compliance with USFS standards.

Applegate-Lassen Trail

A previously unrecorded section of the Applegate-Lassen Trail was discovered and documented during Ruby's Class III cultural resources survey of the Vya Construction Camp. This section of the trail crosses the Vya camp as it travels east-west near the southern edge of the 160-acre camp parcel. Historic artifacts and documentary evidence indicate that this segment of the trail was used as a commercial stage route and local access road after it was used for the initial exploration and settlement of the region. This section of the Applegate-Lassen Trail is recommended as a new contributing element to the NRHP-listed property. The camp parcel is privately owned, but the trail extends into lands administered by the BLM.

Ruby has proposed several measures to protect the integrity of the NRHP-eligible Applegate-Lassen Trail during construction and use of the camp, including:

- The entire 160-acre camp parcel would be fenced and monitored so that only approved workers can access the camp.

- Construction activity at the Vya camp would be monitored by a qualified archaeologist.

- The segment of the trail that crosses the camp parcel near the southern boundary would be avoided through use of a 150-foot buffer and a chain link fence.

- Ruby would prepare a plan for educating workers regarding the significance of and the need for protecting the trail. This plan would also address other historical or natural wildlife/conservation areas and tribal lands in the region as recommended in section 4.8.3.6.

- Ruby's POD would address the protection of the trail at the Vya camp.

Upon completion of the Ruby Pipeline Project, the construction camp would be completely dismantled and all camp facilities would be removed. The land surface would be regraded, cleaned-up, and restored to preconstruction conditions in accordance with Ruby's Plan. These restoration efforts also would be monitored by a qualified archaeologist. Visual impacts on the trail from construction are discussed in section 4.8.4.6. Measures to mitigate impacts on the historic trail through the Section 106 process are discussed in Section 4.10.1.3.

4.8.3.3 National WSRs

The National WSR System was created by Congress in 1968 to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. This legislation requires that wild and scenic river considerations be taken into account during federal agency planning. The Ruby Pipeline Project would not impact any currently designated WSRs; however, it would cross one waterbody, Twelvemile Creek, currently under consideration for listing as a WSR.

Twelvemile Creek crosses lands under the jurisdiction of the BLM's Lakeview and Surprise Field Offices. Both field offices were involved in the evaluation of Twelvemile Creek as a potential WSR. The Lakeview Field Office analyzed the eligibility of Twelvemile Creek while the Surprise Field Office made the final listing recommendation. The Lakeview RMP establishes about 4.4 miles of Twelvemile Creek in Oregon and 2.2 miles of Twelvemile Creek along the California/Nevada border as suitable for designation as a recreational WSR. The Surprise Resource Area RMP and Final EIS concurred with the Lakeview RMP analysis for the 2.2-mile portion of Twelvemile Creek along the California/Nevada border but made no recommendation for the 4.4-mile portion in Oregon. The final decision on whether to designate Twelvemile Creek as a WSR is currently pending in Congress. The BLM is protecting the recreational values of the river in the interim until the designation decision is finalized. Recreational rivers are those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past. Typically, to be designated as a recreational river, the recreational opportunities of the river have to be (or at least must have the potential to be) popular enough to attract visitors from throughout or beyond the region, or are rare, unusual, or unique to the region. Visitors generally must be willing to travel long distances to use the river resources for recreational purposes. River-related opportunities could include, but are not limited to, sightseeing, wildlife observation, camping, photography, hiking, fishing, hunting, and boating/rafting.

The project would cross Twelvemile Creek at MP 588.8 north of the Oregon/Nevada border in an area that is difficult to access by road or trail. Recreational usage of Twelvemile Creek is low due to the limited access. BLM staff familiar with Twelvemile Creek estimate that between 75 and 100 recreational users visit the creek in this area annually; visitors consist primarily of hunters, anglers, and some camping enthusiasts. Visual impacts from construction on this river are discussed in section 4.8.4.6. Ruby would cross Twelvemile Creek using a dry-ditch crossing method and would submit a site-specific stream crossing plan for Twelvemile Creek to the FERC and BLM for review and approval prior to construction. Impacts on the long-term recreational values of the river would be mitigated through development and implementation of the plan.

4.8.3.4 Back Country Byways and National Scenic Byways

The project would parallel one Back Country Byway, cross one Back Country Byway (at two separate locations), and cross one National Scenic Byway. Back Country Byways are routes designated by the BLM to offer the American public opportunities for auto touring and pleasure driving on public lands. The National Scenic Byways Program was established under the Intermodal Surface Transportation Efficiency Act of 1991. Under the program, the U.S. Secretary of Transportation recognizes certain roads as National Scenic Byways or All-American Roads based on their archaeological, cultural, historic, natural, recreational, and scenic qualities. There are 125 such designated byways in 44 states. The project would also cross one National Forest and Utah State Scenic Byway.

Transcontinental Railroad Back Country Byway

The Transcontinental Railroad National Back County Byway is a 90-mile-long dirt and gravel road that extends along the original Central Pacific Railroad grade from the Golden Spike National Historic Site to the Utah-Nevada border. The original railroad grade has been unaltered since 1903. It travels across the northern extension of the Great Salt Lake Desert and follows the northern rim of the Great Salt Lake Depression. This is a barren area of rolling hills and flat lands with expansive views. About half of the byway route is maintained as county road and the other half is not maintained. The byway is administered by the BLM for public use and enjoyment. Due to its unique history and scenic beauty, the byway is a designated Area of Critical Environmental Concern and is listed on the NRHP.

The pipeline route does not cross the Transcontinental Railroad National Back County Byway, but would be parallel to and within 0.5 mile of the byway between MPs 165 to 170 and at MP 210. Although there would be no direct impacts on the byway, the pipeline could indirectly affect the visual character of the byway. Visual impacts on the byway are discussed in section 4.8.4.6. The BLM would incorporate measures into the right-of-way grant to ensure that construction and restoration would be completed in compliance with BLM standards.

Barrel Springs Back Country Byway

The project would cross the Barrel Springs Back Country Byway at MPs 571.5 and 581.9 in northwest Nevada. Both crossing locations are managed by the BLM's Surprise Field Office. The pipeline would cross the byway in undeveloped, rural areas accessible only by unpaved roads and surrounded by open land used for grazing and recreation. Ruby would cross the byway using the open-cut technique, which would result in direct disturbance to the byway and require temporary closure of the road to traffic and the establishment of detours. Construction also would affect the visual character of the byway. Visual impacts from construction on this byway are discussed in section 4.8.4.6. The BLM would incorporate measures into the right-of-way grant to ensure that construction and restoration would be completed in compliance with BLM standards.

Oregon Outback Scenic Byway

The project would cross the Oregon Outback Scenic Byway at MP 614.3 in Lake County, Oregon. The byway is also known as U.S. Highway 395 at this location. The byway is managed by the BLM's Lakeview Field Office. The pipeline would cross the byway in an area that is primarily used for farming and raising livestock. Ruby would install the pipe beneath the road using the bore technique, which would involve no direct disturbance to the byway. However, construction activities in the adjacent right-of-way areas would be visible to parties using the road for a period of about 2 to 5 weeks; visual impacts on this byway are discussed further in section 4.8.4.6. The BLM would incorporate measures into the right-of-way grant to ensure that construction and restoration would be completed in compliance with BLM standards.

Ogden River (Highway 39) Scenic Byway

The project would cross the Ogden River Scenic Byway at MP 73.5, which is not designated nationally but is designated as a National Forest Scenic Byway and Utah State Scenic Byway. The proposed pipeline is not located on National Forest system land where it crosses this byway. Neither the USFS nor the State of Utah includes language in their plans regarding utility crossings of scenic byways. Ruby would install the pipe beneath the road using the bore technique, which would involve no direct disturbance to the byway. However, construction activities in the adjacent right-of-way areas would be visible to parties using the road for a period of about 2 to 5 weeks; visual impacts on this byway are discussed further in section 4.8.4.6.

4.8.3.5 Sheldon NWR

As described in section 4.8.2.1, Ruby proposes to use three existing county roads and six existing smaller roads around and on the Sheldon NWR to provide access to the project. The three county roads provide ingress and egress on the southwest and west sides of the Sheldon NWR. CR 8A is unpaved but has been improved with graded gravel and drainage. CR 8A would be the primary access road to/from the Vya Construction Camp. Ruby's only proposed improvement to CR 8A would be to realign two blind corners of the road for vehicle safety considerations. CRs 34 and 34A are unpaved and unimproved dirt/gravel roads. Ruby does not propose any improvements to CRs 34 or 34A. Although FWS has full jurisdiction over use of these three CRs, they are managed under a joint use agreement between the FWS and Washoe and Humboldt counties, Nevada.

Two of the six smaller access roads, Knott Creek Road (Ruby's road number H-46) and Summit Lake Road (also known as Badger Mountain Road, Ruby's road number H-46B), are dirt/gravel roads maintained by the FWS in conjunction with the Humboldt County Road Department. According to the FWS, these roads are graded, have some gravel, and are occasionally maintained. In many locations these roads are rough, winding, narrow, have switchbacks and hairpin curves, cross wet swales, are worn-down to native rock on hills, and travel through or are adjacent to sensitive wildlife habitats. Higher-elevation sections are only passable seasonally. The FWS has noted that mountain mahogany is known to grow along Summit Lake Road. Ruby has proposed to blade Knott Creek Road and Summit Lake Road where necessary to accommodate construction traffic, and to install a flume bridge over one dry wash on Knott Creek Road. The FWS has indicated that project activities that damage or remove mountain mahogany along Summit Lake Road would be discouraged or prohibited, and requested more specific project information from Ruby regarding the use and improvement of both roads (*e.g.*, vehicle numbers and types, frequency of use, improvement areas, material sources, costs, and mitigation). The FWS has indicated that, following analyses for appropriateness and compatibility, Ruby's use or improvement of Knott Creek Road and Summit Lake Road could potentially be authorized for use. The FWS also would prepare and issue a ROD for this federal decision.

The remaining four smaller access roads are two-tracks (Ruby road numbers, W-1, H-52, H-53, and H-54). Ruby's two-track numbers H-53 and H-54 are included in this impact assessment; however, if access to two-track number H-50 (located south of the Sheldon NWR on BLM-owned land) is granted, the use of two-tracks H-53 and H-54 would be unnecessary. Substantial improvements would be required to upgrade these two-tracks to facilitate travel by heavy construction-related vehicles. The FWS has indicated that it is considering permanent closure of some of the two-tracks as part of its ongoing CCP process. The FWS further states that Ruby's use and improvement of the two-tracks could result in multiple adverse effects to natural and cultural resources and public use and such use is not compatible with the purposes or the mission of the Sheldon NWR and the NWR System. For these and other reasons, the FWS has stated that it is highly unlikely it would grant approval for the use or improvement of the two-tracks.

Ruby's Sheldon NWR Transportation Plan provides a detailed discussion of anticipated impacts of construction on the roads and specifies the mitigation Ruby would implement to avoid or minimize impacts on access roads on the refuge. This plan has been included in the final EIS as an addendum to Ruby's general Traffic and Transportation Management Plan (Appendix X). A summary of impacts on the Sheldon NWR from use and improvements of roads and other access routes, and Ruby's proposed mitigation measures are summarized below.

Construction of the project would move progressively from east to west at a rate of approximately 1 mile per day. The roads and other access routes through the Sheldon NWR would be used for approximately 6 months, and the vehicle count would vary from day to day. The habitat along the proposed access roads around and in the Sheldon NWR is sagebrush steppe, the most abundant habitat type at Sheldon NWR. When ungrazed by domestic livestock, such as is the case on the Sheldon NWR, sagebrush steppe habitat is one of the nation's more endangered ecosystems (Noss and Peters, Dec 1995; Noss, R.F. et al., 1995). The FWS has stated its concern that impacts from the improvement and use of roads and other access routes could include increased safety hazards, loss of vegetation, potential soil erosion, habitat fragmentation, disturbance to and a redistribution of wildlife species, potential stream and wetland impacts, an increased potential for feral horses and burros to move onto the refuge, introduction of invasive plant species, generation of road dust, disturbance to higher-priority users of the Sheldon NWR (e.g., hunters, anglers, and wildlife observers and photographers), and a likely increase in vandalism, poaching, littering, fence cutting, and gate opening.

Although these are existing roads, some of the impacts of use and improvement of roads and other access routes on physical and biological resources would be similar to those impacts related the construction right-of-way, addressed by resource type in sections 4.1 through 4.7 and 4.9 through 4.12. Ruby would be required to implement its mitigation plans (*e.g.*, Sheldon Transportation Plan, Plan, Procedures, Restoration and Revegetation Plans, Noxious and Invasive Weed Control Plan, Fugitive Dust Control Plan, etc.) as well as our recommendations (see section 5.2), and any site-specific requirements identified by the FWS.

The FWS expressed specific concerns regarding the impact of use and improvements of the roads on recreational users of the Sheldon NWR. Wildlife-dependent recreation on the Sheldon NWR is currently limited by the location and quality of roads and other access routes. Where they occur in the same areas as construction, project-related activities could discourage and potentially directly conflict with the FWS' higher-priority wildlife-dependent uses such as hunting, fishing, wildlife observation, and photography. The FWS states that no mitigation could compensate for this short-term impact, which would occur for approximately 6 months.

The FWS also expressed specific concerns regarding the potential impact of increased access to WSAs because of the proximity of access roads to WSAs. No access roads are located within WSAs, although Highway 140, CR 8A, Knott Creek Road, and Summit Lake Road all are adjacent to WSAs along portions of their routes. The nearby increase in vehicular traffic could adversely affect the WSAs' wilderness character and would conflict with the management direction of the WSA. The FWS stated that any improvements of access roads through the Sheldon NWR would be conditioned on the prevention of inappropriate uses within a WSA.

According to the FWS, Ruby's proposed access road use within the Sheldon NWR could impact ongoing research programs on the Sheldon NWR. Based on information provided by the FWS, we have determined that most research programs in the vicinity of the project already have been completed or are sufficiently far from the access roads such that they would not be affected by construction. However, use of access roads during construction could affect a grazing exclosure study being conducted on the south end of the refuge. The grazing exclosure study was initiated in 2008 with the purpose of investigating the effects of feral horse use on hydrology as well as vegetative and invertebrate communities. Collaborators on the study include the FWS, the Oregon Agricultural Research Station, the Brigham Young University, the University of California, and the University of Nevada. Ruby's proposed access road use and improvement could damage fences and other barriers to the exclosure area and negatively impact the research. The FWS indicated it would require diligent monitoring and repair of exclosure barriers on the Sheldon NWR to minimize the likelihood of this occurring if the use or improvement of access roads on the NWR is authorized.

The FWS also raised concerns regarding use of the 14 campgrounds within the Sheldon NWR, which are designed to provide primitive experiences to wildlife-dependent public users such as hunters, anglers, wildlife observers, and photographers. With the exception of Virgin Valley Campground, the campgrounds are not developed nor are they managed to accommodate large crowds or multiple large vehicles. Most are small and remote and are difficult to access, and have no potable water, sanitary facilities, tables, or trash collection. Consistent with the Sheldon NWR's statutory guidance, these campgrounds provide overnight spaces in support of Sheldon NWR's primary and highest-priority clientele, that is, wildlife-dependent public users. There is a 2-week limit on campground use by the public. Consistent with federal statute (National Wildlife Refuge System Administration Act of 1966, as amended, 16 U.S.C. 668dd-668ee) and FWS policy (Administration of Specialized Uses, 5 RM 17), use by pipeline construction workers as living accommodations during construction would constitute an economic use, the Sheldon NWR's lowest priority use. Before any pipeline construction workers could use Sheldon NWR's primitive campgrounds, a special use permit would be required. Before the special use permit could be issued, the use would have to formally be found appropriate and determined compatible. In light of the size, remoteness, and primitive nature of most of the NWR's campgrounds, the FWS states that the environmental impacts generated from use by a large number of campers make it unlikely that issuance of such a special use permit for an economic use of this nature could be justified.

However, based on our review of the situation, while it is possible that the influx of non-local workers to the general vicinity could result in increased use of the refuge's campgrounds, project-related camping on the Sheldon NWR is not expected to occur. Construction workers would not be allowed to use the Sheldon NWR facilities during construction work days. Due to the nature of pipeline construction and the demanding work schedule (6 to 7 days per week, 10 to 12 hours per day) it would be unlikely that workers would use the Sheldon NWR for recreation on their days off. In addition, if construction workers chose to use and explore the Sheldon NWR's campground features on their own time, the construction workers would be restricted to using the campgrounds for the stated purposes and durations.

4.8.3.6 Other Recreational Areas

Rock Creek Camp

We received comments during the review period for the draft EIS that the Southern Langell Valley Route Alternative, if approved, would be within 120 feet of a BLM-managed camp site at MP R651.8 called the Rock Creek Camp. We recommended in the draft EIS that Ruby incorporate the Southern Langell Valley Route Alternative into the final pipeline route. Ruby subsequently adopted this alternative, and as such, it is now a part of Ruby's proposed project. The campsite at MP R651.8 is a remote site at which BLM has recently installed improvements (picnic table, fire grate, and vault toilet). Although construction would not directly affect the campsite, the public would be inconvenienced by limited access, increased congestion, noise and dust, and impacts on vegetation and visual aesthetics, resulting in fewer opportunities to fully enjoy the facilities. These effects would be mostly short-term and limited to the duration of construction, except for effects to vegetation, which would require 1 year or more to reestablish. Ruby would coordinate development of the construction schedule and mitigation measures with the BLM Klamath Falls Resource Area Field Office, and the BLM would incorporate measures into the right-of-way grant to ensure that construction and restoration would be completed in compliance with BLM standards. Recreational uses would return to normal after construction.

Black Rock Desert-High Rock Canyon Emigrant Trails NCA and Black Rock Desert Wilderness Areas

We received comments during the review period for the draft EIS regarding the project's impacts on the Black Rock Desert-High Rock Canyon Emigrant Trails National Conservation Area (NCA) and the adjacent Black Rock Desert Wilderness Area. The NCA and the wilderness area are south of the Sheldon NWR in northwestern Nevada and are managed by the BLM. The proposed pipeline would be routed in-between these two areas and the Sheldon NWR, generally between MPs 495 and 560. While the pipeline would not cross either of these two areas, it would be within approximately 1 mile of the northern boundary of the Black Rock Desert Wilderness Area between MP 496 to 500 and within approximately 1 mile of the northern boundary of the NCA between MP 548 to 558.

The NCA is protected for its historical significance associated with emigrant trails and for wilderness recreation. The wilderness area was set aside for scientific study and non-mechanized recreation. The proximity of the proposed pipeline at the two locations nearest the Black Rock Desert-High Rock Canyon Emigrant Trails NCA and Black Rock Desert Wilderness Area occur close to and cross already established roads (Leonard Creek Road and CR 8A). Visitors to the NCA or wilderness area may notice increased levels of construction traffic on roads in the general area; however, impacts on the recreational or historic values of the areas would be minor, short-term, and limited to the duration of construction at those locations.

Burning Man Festival

The Burning Man Festival is a popular annual recreational event that occurs annually in Nevada's Black Rock Desert, approximately 63 miles southeast of Vya. This festival is a weeklong event that occurs around Labor Day weekend and attracts almost 50,000 people. While the project is sufficiently far enough away from the festival as to not cause a direct impact, the presence of construction traffic associated with the Vya Construction Camp could disturb access of those traveling to the Burning Man Festival on SR 34.

The entrance to the Burning Man Festival is from SR 34 approximately 8 miles north of Gerlach, Nevada. Participants driving to the festival from the north could travel south on either SR 447 or SR 34, and participants using the SR 34 route would pass by the Vya Construction Camp. However, most of the festival attendees are expected to arrive via the south route.

Increased vehicle traffic from construction of the project around the Vya Construction Camp could cause traffic congestion and frustrations for festival participants travelling to and from the festival. To reduce these impacts, Ruby would work with Washoe County to mitigate traffic impacts by not scheduling any major shift changes in personnel during times when the majority of people are entering or leaving the Burning Man Festival. Ruby would employ traffic monitors during the festival to ensure that construction traffic does not disturb access of festival attendees, and Ruby would place signs on CRs 34 and 8A to alert drivers to the presence of construction-related traffic. Ruby would be responsible for removing the signs during decommissioning of the Vya camp.

Northwestern Nevada Sensitive Area - Contractor Education

We received comments during the draft EIS comment period concerning the protection of historic and natural wildlife/conservation areas and tribal lands in northern Washoe and Humboldt counties, Nevada, particularly due to the large number of construction workers placed within driving distance from the Vya Construction Camp. Ruby committed to requiring that each occupant of the Vya camp read and sign orientation documents containing information on use restrictions regarding historic and natural wildlife/conservation areas and tribal lands near the Vya camp. We find this contractor education approach acceptable, but believe this plan should be extended to reach construction personnel along a larger area of the pipeline route in this area. Ruby should provide this education to all contractors working generally between MPs 490 to 580, and the education materials should address areas such as the Applegate-Lassen Trail, the Sheldon NWR, the Black Rock NCA, the Black Rock Desert Wilderness, the Massacre Rim WSA, and tribal lands on the Summit Lake Indian Reservation. Ruby has stated that it would hold contractors accountable for compliance with use restrictions associated with working near these sensitive areas. Ruby has also stated that it would welcome input from any agencies that would like specific information included in the education materials. To ensure that construction personnel respect and abide by use restrictions associated with sensitive areas in northwestern Nevada, **we recommend that Ruby provide its Northwestern Nevada Sensitive Area Contractor Education training to all of its contractor personnel working between MPs 490 and 580**.

4.8.4 Visual Resources

The term "visual resources" refers to the composite of basic terrain features, geologic features, hydrologic features, vegetative patterns, and anthropogenic features that influence the visual appeal of an area. The project would cross federal, state, and privately owned lands. NEPA, the Forest and Rangeland Renewable Resources Planning Act of 1974 (as amended by the National Forest Management Act of 1976), and the FLPMA require the management of scenic resources on federal lands and ensure that scenic resources are treated equally with other resources. Private lands that would be crossed by the proposed pipeline route are not subject to federal or state visual management standards.

This assessment identifies the visual impacts from construction and operation of the proposed project. Changes to the existing visual character and overall pre- and post-project visual conditions were evaluated to assess compliance with the BLM Visual Resource Management (VRM) System and the USFS Visual Management System (VMS) and Scenery Management System (SMS). Section 4.8.4 was prepared entirely by the BLM.

4.8.4.1 Existing Visual Character

The overall visual character of the project area varies dramatically along the entire length of the pipeline and reflects dominant landforms, unique geologic patterns, distinct biotic communities, and land uses. The project would cross five ecoregions: Wyoming Basin, Wasatch and Uinta Mountains, Central Basin and Range, Northern Basin and Range, and Eastern Cascade Slopes and Foothills (EPA, 2009g). Each ecoregion has distinct landforms, climate, vegetation, and wildlife. In terms of visual resources, an ecoregion typically comprises similar dominant landscape character components. The assessment identified additional landform and vegetation characteristics within each ecoregion based on local conditions and assessed the characteristics over the length of the project. The assessment also identified nine regional landscape character units to further define the existing visual character of the project and to help analyze potential impacts on visual resources in areas with similar landscape characteristics (see table 4.8.4-1). Regional landscape character units were developed based on the assumption that visual impacts within the same landscape character unit would be similar regardless of the ecoregion in which they reside.

4.8.4.2 Existing Visual Condition

The Ruby Pipeline Project would initially traverse a landscape dominated by sagebrush, grasslands, and existing gas pipelines at the easternmost point in Opal, Wyoming. The project would increase in elevation at the Hogback Mountains and Bear River Divide in Wyoming where junipers occur in dispersed areas and aspen groves occur on north-facing slopes. The project would then travel west into eastern Utah where junipers and aspens are no longer present and sagebrush dominates the landscape, except in limited areas of agricultural fields, small-scale buildings, and power lines. The pipeline would then proceed to higher elevations where juniper woodlands are again present and large stands of aspens are present on north-facing slopes. The landscape character is more densely wooded with large stands of aspens and coniferous trees near the Cache National Forest in Utah. Visibility in this area is limited because of the irregular terrain and the dense stands of evergreen trees. As the alignment continues west it would traverse several mountainous valleys and ridges dominated by sagebrush and rabbitbrush before it reaches Brigham City, Utah.

The project would cross numerous broad alkaline valleys dominated by salt playas, sagebrush, and grasslands as it travels west of Brigham City and into Utah and Nevada. In this area, rugged mountain ranges and rolling hills separate valleys and widely scattered ranches which are visible from long distances. Vegetation in this area is dominated by sagebrush and is interspersed with grasslands and occasional riparian areas along intermittent streams. In western Nevada the alignment would travel north along an existing power line and into the Fremont National Forest in Oregon. Within the Fremont National Forest, the project would initially rise in elevation through mountain conifer and mixed forests and would then descend in elevation and travel north of Goose Lake before regaining elevation in mixed conifer forests. The project would closely parallel the California-Oregon border before its terminus in an agricultural valley near Malin, Oregon.

Table 4.8.4-1 Regional Landscape Character Units

Landscape Character Unit	Landform/Topography	Vegetation	Other Features
Mountain Conifer / Mixed Forest 	• Elevations range from approximately 4,900 to 9100 above mean sea level. • Distinct mountainous landforms dominate the setting and provide landmarks in the landscape. • Highly variable landforms with gently sloping foothill areas quickly transitioning to steep slopes within rugged ranges. • Deeply incised valleys and wide, relatively flat higher-elevation meadows. • Elevation differences provide panoramic views from the top of formations, where openings in vegetation allow, and spatially enclosed views from incised valleys between formations.	• Overstory species of pine, oak, and fir dominate. Spruce; aspens; and hardwood species, such as maples, can occur. • Height and density of vegetation limit views to foreground area. • Tree cover can be dense or in clumps or groves creating open meadows that provide varied patterns in the landscape. Open meadows can also create strong lines at their edges with contrast of color and texture • Texture is medium to coarse in the foreground where individual trees are visible. Texture tends to be fine in the middleground with trees densely covering the terrain. • Mixture of conifers and hardwoods accentuate color and texture especially in spring and autumn.	• Limited amount of human disturbance within landscape. Typical structures that may be present include paved and unpaved roads, utilities (above- and belowground), and trails. • Steep, undulating terrain usually prevents long views of any structures and other disturbances that may be present. • Small ponds and ephemeral streams present. • Distinct natural and built features include the Monte Cristo Mountain Range, Bryant Mountain, and Porcupine Dam.
Mountain / Plateau Desertscrub 	• Highly variable topography ranging from rolling foothills and higher-elevation mountains to steep slope faces of plateaus and the gently rolling tops of plateau landforms. • Mountains are more rounded in form, less rugged. • Elevations range from approximately 4,600 to 9,300 above mean sea level. • Large rock formations, exposed by erosion, are often visible above foothill slopes. • Distinct mountainous and plateau landforms dominate the setting and provide landmarks in the landscape.	• Dominated by low, hemispherical shrubs—typically less than 4 feet tall— usually species of sage or salt bush. • Low vegetation allows panoramic views unless spatially enclosed by mountainous/hilly landforms. • Scattered and sometimes deeply incised washes may have riparian vegetation. • Texture is generally fine to medium in the foreground depending on the density of vegetation. Texture tends to be fine in the middleground with the desertscrub vegetation appearing to evenly cover the terrain. • Desertscrub vegetation creates a gray-green hue, interrupted by the varying colors of the soil in areas of more open vegetation.	• Limited amount of human disturbance within landscape. Typical structures that may be present include paved and unpaved roads, utilities (above- and belowground), and trails. • Varied terrain usually prevents long views of any structures and other disturbances that may be present. • Small ponds and ephemeral streams and lakes present. • Distinct natural and built features include Eagle Mountain, Twenty-one Mile Dam, Willow Creek Dam, the Jackson Mountains, and the Granite Mountain Range.
Foothills Grasslands 	• Landforms are usually rolling foothills with occasional rock formations. • Elevations range from approximately 6,000 to 7,300 above mean sea level. • Undulating foothill landforms dominate the setting. • Elevation differences provide panoramic views from the top of formations and spatially enclosed views between formations near bottom of formations.	• Dominant grasses are very low stature—mostly less than 18 inches with moderate to sparse ground coverage. Many locations will have scattered areas dominated by sage species or other herbaceous species. • Low vegetation allows panoramic views unless enclosed by mountainous/hilly landforms. • Texture is generally fine, appearing to evenly cover the terrain; creating a "bald" appearance of the landforms. • Color is generally monochromatic. Varies by season, changing from bright green in the spring to softer yellow brown in late summer to fall.	• Limited amount of human disturbance most areas are subject to grazing. Structures that may be present include paved and unpaved roads, utilities (above- and belowground), trails, and fences. • Rolling terrain interrupts long views of any structures and other disturbances that may be present. • Small ponds, rivers, creeks, and ephemeral streams present. • Distinct natural features include Oyster Ridge and Little Round Mountain.

Table 4.8.4-1 Regional Landscape Character Units

Landscape Character Unit	Landform/Topography	Vegetation	Other Features
Juniper-Pinyon Woodland 	• Gently rolling terrain with some areas of steep slopes. • Elevations range from approximately 4,300 to 6,600 above mean sea level. • Rock outcrops and vertical cliff faces especially at deeply incised drainages can be distinctive features in some locations.	• Vegetation density various from widely scattered juniper to dense stands of pinyon, juniper, maples, and oaks. • Height and density of vegetation can restrict views to foreground area. • Evergreen trees provide a strong contrast in color to the adjacent grassland or desertscrub vegetation. • Texture is generally coarse in the foreground where individual trees are visible. In the middleground, the texture tends to be medium to coarse depending on the density of the junipers and pinyons.	• Limited amount of human disturbance. Structures that may be present include paved and unpaved roads, utilities (above- and belowground), and trails. • Rolling terrain usually prevents long views of any structures and other disturbances that may be present. • Ephemeral streams present.
Valley Desertscrub 	• Flat to gently rolling terrain over the extensive valleys between mountain ranges. • Elevations range from approximately 4,500 to 7,100 above mean sea level. • Occasional washes provide topographic relief, but few are deeply incised.	• Vegetation dominated by sage species with intermixed grasses or other herbaceous species. • Texture is generally medium to coarse in the foreground depending on the density of vegetation. In the middleground, the texture tends to be fine with the desertscrub vegetation appearing to evenly cover the terrain. • Desertscrub vegetation creates a gray-green hue, interrupted by the varying colors of the soil in areas of more open vegetation.	• Limited amount of human disturbance. Structures that may be present include isolated ranches and associated buildings, such as barns, paved and unpaved roads, utilities (above- and belowground), trails, and fencing. • Ephemeral streams present. • Distinct natural features include Lone Butte, Painted Point, Sage Hen Summit, and Squaw Valley.
Valley Grasslands 	• Flat to gently rolling terrain over the extensive valleys between mountain ranges. Transition from valley to mountain ranges can be abrupt. • Elevations range from approximately 4,200 to 8,000 above mean sea level.	• Dominant grasses are very low stature—mostly less than 18 inches with moderate to sparse ground coverage. • Low vegetation allows unrestricted views over relatively flat terrain. • Texture is generally fine, appearing to evenly cover the terrain especially in the middleground. • Color is generally monochromatic but varies by season with the annual growth cycle of the grasses. The landscape will change from bright green in spring to softer yellow brown in late summer to fall.	• Low to moderate amounts of human disturbance. Structures that may be present include isolated ranches and associated buildings, such as barns, transmission lines, paved and unpaved roads, utilities (above- and belowground), trails, and fencing. • Ephemeral streams present. • Distinct natural features include Bear River Divide, Mud Flats/Salt Wells Flats, Monument Peak, and the Great Salt Lake Desert.

Table 4.8.4-1 Regional Landscape Character Units

Landscape Character Unit	Landform/Topography	Vegetation	Other Features
Salt Desert / Playa 	• Very flat to gently sloped terrain over extensive valley areas. • Playa bottoms may slope only several inches over extended areas, then slope up to surrounding foothills. • Soil/surface color in playa bottoms is very light and extends into surrounding vegetation cover. • Elevations range from approximately 4,300 to 6,100 above mean sea level.	• Very sparse, low-stature vegetation usually dominated by one species, typically a saltbush. Some areas completely devoid of vegetation. • Limited vegetation allows unrestricted views over almost flat terrain. • Soil color creates high contrast with any vegetation that is present.	• Little to no human disturbance except for roads. • No notable waterbodies present. Ephemeral lakes occur in many playa bottoms. • Distinct natural and built features include the Black Rock Desert, Desert Valley, and a railroad that crosses a section of the Black Rock desert playa.
Agriculture / Pastoral Valley 	• Topography is the same as the Valley Desertscrub and Valley Grassland units. • Agricultural areas consist of flat, geometric fields, sometimes with gently sloping areas surrounding them, extending to nearby mountains. • Elevations range from approximately 4,000 to 5,400 above mean sea level.	• Vegetation dominated by the agricultural fields, but often natural-appearing desertscrub or grassland areas surround the fields. • Crops create a high level of contrast when viewed from above, especially during the growing season because of the vivid green color of the fields set against the surrounding undisturbed areas. • Views across the landscape are generally unobstructed.	• Moderate to high level of development/human alteration with leveling of areas for fields. Agricultural and ranching uses occur in distinct locations on the flat valley floor. • Residential and farm buildings are low stature, but widely scattered ranches with large trees are highly visible in the landscape.
Rural/Suburban 	• Terrain is flat to gently sloping up to adjacent foothills or mountains. • Isolated small hill landforms are sometimes located within residential or agricultural areas. • Elevations range from approximately 4,200 to 6,000 above mean sea level.	• Vegetation is dominated by introduced species in developed areas. • Agricultural fields can extend over large areas. Undisturbed areas of desertscrub or grassland vegetation are usually located at the fringes of communities. • Views across the landscape can be obstructed by structures.	• Highest level of development/human alteration within project area. Primarily residential and agricultural uses with some areas of commercial or industrial land uses. • Bringham City, UT, and Winnemucca, NV, have the most notable suburban character with rural residential in outlying areas. • Character unit includes several mine locations not suitable to include in other units. • Distinct natural features include Engineer Mountain and Langell Valley.

4.8.4.3 BLM and USFS Visual Resource Management Objectives

Federal agencies involved in activities proposed on federally managed land must consider the activity's potential effects to visual resources, as well as to biological, cultural, water, and other resources. Each agency has a management program for evaluating the existing visual landscape and determining an activity's or project's ability to meet the goals of that program. The programs used by the BLM and USFS and their specific objectives are described below.

The BLM's VRM System incorporates scenic quality, viewer sensitivity, and distance zones to identify the levels of change or disturbance in the visual landscape that are allowed in certain areas. The BLM designates the VRM classes in its planning process and defines the specific management objectives required to maintain a given area's visual setting—that is, its VRM class objectives. The objectives of each VRM classification, as described in the BLM VRM Manual 8400 (BLM, 2003a), are listed in table 4.8.4-2.

TABLE 4.8.4-2

BLM's VRM System Classes and Management Objectives

VRM Class	Management Objective
I	Preserve the existing character of the landscape. This class provides for natural ecological changes but does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.
II	Retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.
III	Partially retain the existing character of the landscape. The level of change to characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.
IV	Provide for management activities that require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high.

The USFS has established a VMS to inventory, evaluate, and manage scenic resources on National Forest lands. The VMS combines scenic quality, viewer sensitivity, and distance zones to develop VQOs. VQOs are assigned to the landscape to describe the degree of acceptable alteration of the natural landscape. VQO classifications include Preservation, Retention, Partial Retention, Modification, and Maximum Modification. The Preservation classification allows for ecological changes only, while the Maximum Modification classification allows for landscape changes that may dominate the natural landscape character.

The USFS has updated the VMS process to the SMS, which is currently being incorporated into respective National Forest management plans. Full adoption of the SMS would occur as each National Forest revises its LRMP. Unlike the VMS, the SMS is integrated with ecosystem management and addresses landscape character, constituent preferences, scenic integrity, and landscape visibility as key aesthetic considerations. Scenic integrity objectives (SIOs) are classified as very high, high, moderate, low, and very low and are used much in the same way as VQOs.

4.8.4.4 Other Managed Scenic Resource Programs

Lands managed under several other national and state scenic resource programs exist within the project area. Such programs include national and state scenic byways, national historic trails, and WSRs.

Scenic and Back Country Byways

Two designated scenic byways and two back country byways exist within the project area: the Highway 39-Ogden River Scenic Byway and Transcontinental Railroad National Back Country Byway in Utah, the Barrel Springs Back County Byway in Nevada, and the Oregon Outback National Scenic Byway in Oregon. The Highway 39-Ogden River Scenic Byway travels through mostly private land in the project area and is designated as a National Forest Scenic Byway and a Utah State Scenic Byway. The proposed alignment would cross this byway at about MP 73.5 and is roughly parallel to the byway from about MPs 70 to 73. The Transcontinental Railroad National Back Country Byway is managed by the BLM Salt Lake District Office and traverses the flat lands of the Great Salt Lake Desert. The byway follows the deserted Central Pacific Railroad grade that stretches between the area just west of Golden Spike National Historic Site and the Utah-Nevada border. The project would parallel a portion of the byway but would not cross it. The Barrel Springs Back Country Byway is managed by the BLM Surprise District Office. The project would intersect the byway at about MPs 564 and 582. The Oregon Outback National Scenic Byway begins at Highway 395 on the Oregon/California border and extends 171 miles north through eastern Oregon. The project would cross the Oregon Outback National Scenic Byway at about MP 614. The Lakeview RMP's management direction for this byway provides that all projects be designed to maximize scenic quality and minimize scenic intrusions.

National Historic Trail System

Portions of the Oregon and California National Historic Trails, Applegate-Lassen Trail, and Emigrant Trail would be crossed by or are parallel to the project area. These trails were part of a network of significant routes of travel used by settlers moving west into California and Oregon. The project would cross a segment of the Oregon/California Trail specifically designated for highway vehicle touring near MP 20.

WSR System

As noted in section 4.8.3.3, the BLM and USFS analyze rivers under their jurisdiction for suitability as a WSR and recommend rivers deemed "eligible" and "suitable" for designation by Congress. The project would not cross any rivers designated as a WSR. However, the project would cross Twelvemile Creek on BLM land near MP 590.0, which has been deemed "eligible" for designation as a WSR.

4.8.4.5 Visual Resource Impacts

Scenic or visual impacts are defined as the change in aesthetic value resulting from the introduction of modifications to the landscape. The nine regional landscape character units in the project area have been evaluated in terms of the anticipated magnitude of change in landscape character and the visibility of the proposed pipeline and associated aboveground facilities. The evaluation of impacts used an analysis of visual dominance, scale, continuity, and contrast to determine the degree to which the proposed pipeline and associated aboveground facilities would attract attention and to assess the relative change in character as compared to the existing characteristic landscape. Consideration of the amount of visual contrast created is directly related to the amount of attention that is drawn to an element in the landscape. For this assessment, the change in visual character was based on comparing the post-project condition to the visual elements and patterns of the regional landscape character units within the project area. The assessment of the change in visual character assumed that the landscape within the character units is intact with no evidence of any significant discordant features in either the natural or cultural

settings. The magnitude of the changes in visual character from existing conditions to post-project conditions for this assessment are categorized as very low, low, moderate, high, and very high changes, as defined in table 4.8.4-3.

TABLE 4.8.4-3

Magnitude of Change in Landscape Character Ratings

Rating	Definition
Very Low	Landscape character remains intact with no apparent change to the existing visual elements (line, form, color, and texture) or pattern character (dominance, scale, diversity, and continuity) in the landscape.
Low	Magnitude of change from the existing landscape character is subtle and the changes in visual pattern elements or pattern character do not attract attention.
Moderate	Magnitude of change from the existing landscape character is noticeable and the changes in visual pattern elements or pattern character attract attention.
High	Magnitude of change from the existing landscape character is substantial and the changes in visual pattern elements or pattern character begin to dominate the landscape.
Very High	Magnitude of change from the existing landscape character is severe and the changes in visual pattern elements or pattern character dominate the landscape.

Each of the nine regional landscape character units was evaluated based on viewer position and distance zone to determine the magnitude of change. Viewer position affects the perception of the degree of dominance of elements and patterns in the landscape. Distance zones are based on the distance from where the visual element is located in reference to the viewpoint. For this project, distance zones refer to the distance from the critical viewing platforms or key observation points (KOP) to the proposed pipeline. The distance zones were classified as foreground (0 feet to 0.5 mile) and middleground (0.5 mile to 5.0 miles). Typically, people view changes in landscapes within the foreground more critically than changes in the middleground because of the ability to perceive greater detail the closer a person is to the landscape features.

The evaluation of changes from existing conditions to post-project conditions within the project area also considered changes in visibility. The visibility analysis was performed for the proposed route using ArcView Spatial Analyst. The analysis identified all areas that could be seen from the pipeline, as well as the areas that would be visible from the linear viewing platforms, such as scenic byways and historic trails. The analysis identified where the pipeline would be visible *if there were no vegetation or structures* to screen the pipeline. This analysis, based on a "bald" landscape, reflects the worst-case scenario in determining the potential scenic impacts. Existing vegetation would substantially help to minimize the impacts on the scenic resources by screening views to and from the pipeline. Table 4.8.4-4 presents a matrix summary of the magnitude of visual change by landscape unit, viewing distance, and viewing orientation.

Impacts from construction of the project were also evaluated in terms of the impacts over time. For this assessment, short-term impacts are defined as effects that would be less than 3 years in duration and long-term impacts are considered to be impacts that would persist more than 3 years.

A discussion of the specific visual impacts that would occur within each of the nine regional landscape character units is presented below. The following describes in qualitative terms the potential direct impacts on the visual resources from the proposed pipeline and the associated aboveground facilities.

TABLE 4.8.4-4

Magnitude of Change in Visual Character in Regional Landscape Character Units Along the Ruby Pipeline Project

Distance Zone/ Viewer Position[a]	Regional Landscape Character Units[b]								
	MC/MF	M/P DS	FG	J-P W	VDS	VG	SD/P	A/PV	R/S
Foreground									
Parallel/Tangential	L	L	VL	L	L	VL	VL	VL	VL
Head-on	M	M	L	M	M	L	M	L	VL
Intersecting	M	M	L	L	L	L	L	L	VL
Middleground									
Head-on	M	M	VL	M	M	VL	M	VL	VL

a The position of the viewer relative to the landscape may be described as parallel or tangential, head-on, or intersecting. Head-on views can be either from a superior (above) or inferior (below) viewer position. Intersecting viewer position refers to the perpendicular crossing of the pipeline.

b MC/MF = Mountain Conifer/Mixed Forest; M/P DS = Mountain/Plateau Desertscrub; FG = Foothills Grassland; J-P W = Juniper-Pinyon Woodland; VDS = Valley Desertscrub; VG = Valley Grasslands; SD/P = Salt Desert/Playa; A/PV = Agriculture/Pastoral Valley; R/S = Rural/Suburban; VL = Very Low; L = Low; M = Moderate; H = High; VH = Very High

Mountain Conifer/Mixed Forest, Mountain/Plateau Desertscrub, and Juniper Pinyon Woodlands Landscape Character Unit Direct Impacts

The magnitude of change in the landscape character created by construction of the proposed pipeline within the Mountain Conifer/Mixed Forest Regional Landscape Character Unit would range from low to moderate (see table 4.8.4-4). Ground-disturbing activities would remove stands of vegetation, which would create a moderate level of change in the visual character of the landscape in this unit in the short- and long-term. The spatial enclosure and shortened views common in mountainous terrain would increase visual dominance of the pipeline area in foreground views. The spatial enclosure would be enhanced in the Mountain Conifer/Mixed Forest and Juniper-Pinyon Woodlands Regional Landscape Character Units because the height of the evergreen trees would attract more attention to the proposed pipeline. Head-on and intersecting views would still have a higher level of visibility in the middleground because of the sloping nature of the terrain. The variable patchiness of juniper vegetation would reduce the attraction of intersecting views of the pipeline in the Juniper-Pinyon Woodlands Regional Landscape Character Unit. The removal of vegetation and the constant width of the cleared area for the pipeline also would create a moderate level of contrast in the short-term because of the introduction of distinct lines in the landscape in both the foreground and middleground distance zones. Parallel views of the pipeline from linear viewing platforms such as roads or trails would not attract as much attention away from the natural setting since the proposed pipeline would mimic the linear form of this type of viewing platform. The cleared area for the pipeline would be highly visible from a head-on viewpoint in the foreground and middleground distance zones and would attract attention away from the natural landscape setting.

No compressor stations are planned within the Mountain Conifer/Mixed Forest or Juniper-Pinyon Woodland Regional Landscape Character Unit; therefore, there would be no direct impacts. The Weiland Flat Compressor Station would be located within the Mountain/Plateau Desertscrub Regional Landscape Character Unit. The clearing of vegetation on the approximately 25-acre site would create a relatively large, geometric shaped area with a moderate level of contrast to the surrounding landscape. The compressor station would introduce vertical and geometric lines and forms and have a strong contrast with the existing landscape. This would result in a moderate magnitude of change to the existing landscape character and permanent impacts. A test manifold and two pipe storage areas also would be in the Mountain Desertscrub Regional Landscape Character Unit and would have impacts similar to the compressor station with regard to increased contrast and a notable change in landscape character. The

impacts from the staging and storage sites would be short-term because these sites would not remain in permanent use after construction. MLVs, pig launchers/receivers, and water appropriation sites would be located within each of these units. Depending on the specific site location, construction of these aboveground facilities would require removal of additional trees and vegetation and would contribute to the contrast in line and color. Staging areas averaging approximately 1 acre per site would slightly increase the area of change in landscape character and would increase contrast over the short- and long-term.

Foothills Grasslands and Valley Grasslands Regional Landscape Character Unit Direct Impacts

The magnitude of change in the landscape character created by construction of the proposed pipeline within the Foothills Grassland and Valley Grasslands Regional Landscape Character Units would range from low to very low (see table 4.8.4-4). Ground-disturbing activities would remove bands of low grasses and desertscrub, which would create low to very low change in the characteristic landscape of these units and would be noticeable in the natural setting for the short-term. The low stature of the vegetation and the sloping nature of the landforms in the Foothills Grassland Regional Landscape Character Units would increase the distance from which the disturbance could be seen. The open panoramic views common in flat valley terrain would decrease visual dominance of the proposed pipeline in the Valley Grasslands Regional Landscape Character Unit. Removal of the low vegetation would also create a low level of contrast in the short-term because of the introduction of distinct lines in the landscape in the foreground distance zone. The change to the existing landscape character in the middleground would be very low. Parallel views of the pipeline from linear viewing platforms would be even less noticeable in the natural setting since the proposed pipeline alignment would mimic the linear form of this type of viewing platform.

No compressor stations are planned within the Foothills Grasslands Regional Landscape Character Unit; therefore, there would be no direct impacts. The Roberson Creek compressor station would be located within the Valley Grassland Regional Landscape Character Unit. The clearing of vegetation on the associated site would create a relatively large, geometric shaped area with a moderate level of contrast to the surrounding landscape. The compressor station would introduce vertical and geometric lines and forms not currently present and would create a strong contrast with the existing horizontal to indistinct lines and forms in the landscape. This would result in moderate magnitude of change from the existing landscape character, and a permanent change. MLVs, pig launchers/receivers, and water appropriation sites would be located within both units. Depending on the specific site location, these aboveground facilities would introduce vertical, geometric shapes into the character unit and would contribute to a contrast in both line and form. Staging areas averaging approximately 1 acre per site would slightly increase the area of change in landscape character and contrast over the short- and long-term.

Valley Desertscrub and Salt Desert /Playa Regional Landscape Character Unit Direct Impacts

The magnitude of change in the landscape character created by the construction of the proposed pipeline within the Valley Desertscrub and Salt Desert/Playa Regional Landscape Character Unit would range from very low to moderate (see table 4.8.4-4). Ground-disturbing activities would remove bands of grasses and low desertscrub, which would create a notable change in the characteristic landscape of this unit and would attract attention away from the natural setting in the short- and long-term. The panoramic views common in flat valley terrain would reduce visual dominance of the proposed project. Removal of the low vegetation, especially in areas of dense cover and the constant width of the cleared area for the pipeline would create a very low to moderate level of contrast in the short-term because of the introduction of distinct lines and a contrasting, light soil color in the landscape in the foreground distance zone. The contrast would increase in the Salt Desert/Playa Regional Landscape Character Unit because

of the area's almost white-colored soil. The change to the existing landscape character in the middleground would be notable. Parallel views of the pipeline from linear viewing platforms would not attract as much attention away from the natural setting since the proposed pipeline would mimic the linear form of this type of viewing platform.

No compressor stations are planned in the Valley Desertscrub Regional Landscape Character Unit; therefore, there would be no direct impacts. The approximately 24.5-acre site for the Desert Valley Compressor Station and the 29.5-acre site for the Wildcat Hills Compressor Station would be located within the Salt Desert/Playa Regional Landscape Character Unit. Clearing of vegetation on the associated sites would have similar impacts on the existing landscape character as the facilities in the Foothills and Valley Grasslands Regional Landscape Character Units (a moderate level of contrast from the clearing of vegetation and a strong level of contrast from the introduction of discordant lines and forms). MLVs, pig launchers/receivers, and water appropriation sites would occur within this unit. These aboveground facilities also would introduce vertical, geometric shapes into the character unit and would contribute to the contrast in both line and form. Staging areas averaging approximately 1 acre per site would slightly increase the area of change in landscape character and would increase contrast over the short- and long-term.

Agriculture/Pastoral Valley and Rural/Suburban Regional Landscape Character Unit Direct Impacts

The magnitude of change in the landscape character created by construction of the proposed pipeline within the Agriculture and Pastoral Valley and the Rural/Suburban Regional Landscape Character Units would be very low to low (Table 4.8.4-4). Ground-disturbing activities would primarily remove bands of mixed natural and rural vegetation, which would create very low change in the characteristic landscape of this unit. The panoramic views common in flat valley terrain would decrease visual dominance of the proposed pipeline. Removal of the existing vegetation and the constant width of the area cleared for the pipeline would create a very low level of contrast in the short-term, with the introduction of subtle lines in the landscape in the foreground and middleground distance zones. Views of the pipeline would be less noticeable than in the natural setting since the proposed pipeline would mimic the linear forms (*e.g.*, fields and roads) found in these units.

No compressor stations are planned within these units; therefore, there would be no direct impacts. Ancillary aboveground facilities would have a very low magnitude of change in the landscape character because of the developed characteristics of the existing landscape setting.

Regional Landscape Character Unit Indirect Impacts

The construction of the proposed pipeline may result in short-term and minor indirect impacts. The cleared area for the pipeline would create opportunities where people could park or access the area using their vehicles within the construction area to gain access to otherwise previously inaccessible areas of the landscape. This could result in trampling of vegetation and additional resource damage, which would lower the area's scenic attractiveness and level of intactness. The access to the project area would also provide scenic viewing opportunities not currently available to many people.

4.8.4.6 Compliance with Management Objectives

BLM VRM Compliance

BLM has developed measurable standards for managing the visual resources of BLM lands. As previously noted, management classes with established objectives have been identified for the project

area's visual resources as part of the RMP process. This analysis determined whether or not the pipeline, and the associated aboveground facilities would be in compliance with the established objectives. Based on the respective VRM, the stated management objectives were compared to the proposed pipeline and aboveground facilities' magnitude of change in visual character based on the regional landscape character and the visual contrast created between the proposed pipeline and the existing landscape.

The BLM's Visual Resource Contrast System Handbook 8431-1 (BLM, 2003b) was used to evaluate the visual contrast created between the proposed pipeline and the existing landscape. The degree to which a management activity affects the visual quality of a landscape is largely dependent on the visual contrast created between the proposed project and the existing landscape. The contrast can be measured by comparing the project features or components with the major features in the landscape. The basic visual elements of form, line, color, and texture are used to make this comparison and to describe the magnitude of the visual contrast created by the proposed project.

The contrast rating evaluations were conducted from 32 KOPs within the project area. The majority of the KOPs were selected by the BLM Field Offices. Some points were also determined based on other known sensitive viewpoints. The location of each of the KOP and the associated contrast rating evaluations are included in table 4.8.4-5.

The determination of whether or not the proposed action would be in compliance with the various BLM management objectives is provided in table 4.8.4-6. The determination of compliance was based on the results of the contrast rating evaluations at the KOPs and if there were no KOPs identified, the magnitude of change in the landscape character based on the regional landscape character. Based on this evaluation, the proposed pipeline and associated aboveground facilities would create notable levels of changes to the landscape. The changes would attract the attention of the casual observer because of the moderate level of contrast in line and color in addition to the contrast in form by the four compressor stations. Therefore, the proposed route would not comply with Class I and Class II visual management objectives without the implementation of additional mitigation measures. If the site-specific measures that would be identified in Ruby's POD are implemented, as well as the mitigation measures as outlined in section 4.8.4.7, the changes associated with the proposed pipeline would be subordinate, *i.e.,* repeat the basic elements found in the natural and cultural landscape characteristics. Construction and maintenance of the proposed project would then comply with the existing Class I and Class II visual management objectives. Compliance with the existing Class III and Class IV visual management objectives would also be achieved with the implementation of the mitigation measures listed in section 4.8.4.7.

TABLE 4.8.4-5

Location of KOPs Along the Ruby Pipeline Project

Feature/KOP Name	Approximate MP	VRM Class
Linear Feature		
Oregon Trail	20.0	IV
Oregon / California Auto Route	20.0	IV
Ogden River Scenic Byway	75.0	IV
Emigrant Trail	172.0	IV
Transcontinental Railroad National Back Country Byway	210.0	III
California Trail	267.0	IV
Barrel Springs Back Country Byway (North)	581.9	II & III
Barrel Springs Back Country Byway (South)	571.5	I & IV
Twelvemile Creek Crossing	588.5	II
Oregon Outback Scenic Byway	614.0	N/A[a]
Point location		
Road Crossing on Route 30	0.5	II
Roberson Creek Compressor Station	6.0	IV
Oregon Trail / California Trail	21.0	IV
Salt Wells	150.5	IV
Wildcat Hills Compressor Station	173.0	IV
Kelton	173.0	IV
Emigrant Trail	R200.6	IV
Winecup Ranch	267.0	II
US Highway 93 Crossing / Staging	271.0	IV
Wieland Flat Compressor Station	330.5	III
Highway 226 Crossing	339.0	III
China Creek Crossing	R364.0	IV
Willow Creek Reservoir	R369.5	IV
Owyhee Bluffs	R393.0	III
Desert Valley Compressor Station	476.5	IV
Black Rock Desert #1 from Leonard Creek Road	497.0	IV
Black Rock Desert #2 from Leonard Creek Road	500.5	IV
Lahontan WSA	517.0	I[b]
Badger Mountain	538.0	II
Massacre	549.0	II
Painted Point from Roadway 8	555.0	II
Rock Creek Campground	R651.7	III
Wash near Rock Creek Campground	R651.8	III
Historic Corral	R657.0	III

a Private land, no VRM Class designation
b Viewpoint is within VRM Class IV, but viewing VRM Class I area

TABLE 4.8.4-6

VRM Class Compliance for the Ruby Pipeline Project

BLM District Office/Regional Landscape Character Unit[a]	VRM Class	Foreground			Middleground		
		Acres	Compliance with VRM Class	Additional Mitigation Measures Required	Acres	Compliance with VRM Class	Additional Mitigation Measures Required
Kemmerer District							
M/PDS	I	0	--	--	0	--	--
	II	0	--	--	0	--	--
	III	0	--	--	0	--	--
	IV	14,437	Yes	--	130,200	Yes	No
MG	I	0	--	--	0	--	--
	II	0	--	--	0	--	--
	III	0	--	--	0	--	--
	IV	4,469	Yes	--	35,265	Yes	No
VDS	I	0	--	--	0	--	--
	II	0	--	--	0	--	--
	III	0	--	--	0	--	--
	IV	3,032	Yes	--	21,948	Yes	No
VG	I	0	--	--	0	--	--
	II	0	--	--	7	No	Yes
	III	0	--	--	7,910	--	
	IV	7,404	Yes	No	79,174	Yes	No
A/PV	I	0	--	--	0	--	--
	II	1,225	Yes	No	13,033	Yes	No
	III	0	--	--	0	--	--
	IV	48	Yes	No	655	Yes	No
Salt Lake District							
M/PDS	I	0	--	--	0	--	--
	II	0	--	--	15,267	No	Yes
	III	0	--	--	0	--	--
	IV	888	Yes	No	0	--	--
SD/P	I	0	--		0	--	--
	II	0	--		4,308	No	Yes
	III	296	Yes	No	2,863	Yes	No
	IV	27,754	Yes	No	0	--	--
MC/MF	I	0	--	--	0	--	--
	II	0	--	--	5,089	No	Yes
	III	0	--	--	0	--	--
	IV	0	--	--	80	Yes	No
JW	I	0	--	--	0	--	--
	II	0	--	--	1,436	No	Yes
	III	0	--	--	0	--	--
	IV	0	--	--	5,443	Yes	No

TABLE 4.8.4-6

VRM Class Compliance for the Ruby Pipeline Project

BLM District Office/Regional Landscape Character Unit[a]	VRM Class	Foreground			Middleground		
		Acres	Compliance with VRM Class	Additional Mitigation Measures Required	Acres	Compliance with VRM Class	Additional Mitigation Measures Required
VDS	I	0	--	--	0	--	--
	II	0	--	--	5,089	No	Yes
	III	0	--	--	0	--	--
	IV	1,903	Yes	No	22,191	Yes	No
A/PV	I	0	--	--	0	--	--
	II	0	--	--	1,436	No	Yes
	III	0	--	--	0	--	--
	IV	0	--	--	499	Yes	No
R/S	I	0	--	--	0	--	--
	II	0	--	--	0	--	--
	III	0	--	--	0	--	--
	IV	0	--	--	4,436	Yes	No
Elko District							
M/PDS	I	0	--	--	22	No	Yes
	II	303	No	Yes	33,588	No	Yes
	III	12,834	Yes	No	124,126	Yes	No
	IV	31,786	Yes	No	314,553	Yes	No
JW	I	0	--	--	0	--	--
	II	0	--	--	0	--	--
	III	180	Yes	No	36,700	--	No
	IV	10,687	Yes	No	99,548	--	No
VDS	I	0	--	--	0	--	--
	II	0	--	--	274	No	--
	III	5,879	Yes	No	7,930	Yes	--
	IV	27,733	Yes	No	217,675	Yes	No
SD/P	I	0	--	--	0	--	--
	II	1,058	No	Yes	7,012	No	Yes
	III	0	--	--	2,862	Yes	No
	IV	12,399	Yes	No	83,491	Yes	No
A/PV	I	0	--	--	0	--	--
	II	0	--	--	0	--	--
	III	829	Yes	No	343	Yes	No
	IV	4,080	Yes	No	16,202	Yes	No
Winnemucca District							
M/PDS	I	94	No	Yes	12,484	No	Yes
	II	1,227	No	Yes	10,238	No	Yes
	III	131	Yes	No	41,917	Yes	No

TABLE 4.8.4-6

VRM Class Compliance for the Ruby Pipeline Project

BLM District Office/Regional Landscape Character Unit[a]	VRM Class	Foreground			Middleground		
		Acres	Compliance with VRM Class	Additional Mitigation Measures Required	Acres	Compliance with VRM Class	Additional Mitigation Measures Required
	IV	18,905	Yes	No	196,402	Yes	No
VDS	I	0	--	--	0	--	--
	II	0	--	--	78	No	Yes
	III	8,824	Yes	No	23,901	Yes	No
	IV	16,678	Yes	No	122,114	Yes	No
SD/P	I	627	No	Yes	30,087	No	Yes
	II	0	--	--	0	--	--
	III	0	--	--	1,407	Yes	No
	IV	32,687	Yes	No	223,970	Yes	No
A/PV	I	0	--	--	352	No	Yes
	II	0	--	--	23	No	Yes
	III	2,240	Yes	No	30,269	Yes	No
	IV	4,594	Yes	No	34,587	Yes	No
Surprise District M/PDS	I	--	--	--	18,750	No	Yes
	II	10,657	No	Yes	66,388	No	Yes
	III	0	--	--	19,644	--	--
	IV	0	Yes	No	0	--	--
JW	I	0	--	--	0	--	--
	II	6,448	No	Yes	69,960	No	Yes
	III	3,581	Yes	Yes	25,556	Yes	No
	IV	1	Yes	No	4,051	Yes	No
VDS	I	1,164	No	Yes	46,933	No	Yes
	II	5,125	No	Yes	10,322	No	Yes
	III	0	--	--	0	--	--
	IV	612	Yes	No	10,927	--	--
SD/P	I	975	No	Yes	7,774	No	Yes
	II	790	No	Yes	10,164	No	Yes
	III	56	Yes	No	9,286	Yes	No
	IV	8,148	Yes	No	48,552	Yes	No
A/PV	I	0	--	--	0	--	--
	II	0	--	--	0	--	--
	III	0	--	--	36	Yes	No
	IV	0	--	--	3,452	Yes	No
Lakeview District MC/MF	I	0	--	--	0	--	--
	II	0	--	--	0	--	--
	III	2717	Yes	No	4552	Yes	No

TABLE 4.8.4-6

VRM Class Compliance for the Ruby Pipeline Project

BLM District Office/Regional Landscape Character Unit[a]	VRM Class	Foreground			Middleground		
		Acres	Compliance with VRM Class	Additional Mitigation Measures Required	Acres	Compliance with VRM Class	Additional Mitigation Measures Required
	IV	717	Yes	No	19743	Yes	No
MPDS	I	0	--	--	0		
	II	0	--	--	316	No	Yes
	III	0	--	--	2654	Yes	No
	IV	0	--	--	5546	Yes	No
JW	I	0	--	--	0		
	II	537	No	Yes	5088	No	Yes
	III	4157	Yes	No	29562	Yes	No
	IV	9795	Yes	No	40730	Yes	No
VDS	I	0	--	--	0		
	II	0	--	--	167	No	Yes
	III	0	--	--	3901	Yes	No
	IV	0	--	--	0	--	--
R/S	I	0	--	--	0	--	--
	II	0	--	--	0	--	--
	III	0	--	--	125	Yes	No
	IV	0	--	--	8	Yes	No

a MC/MF = Mountain Conifer/Mixed Forest; M/P DS = Mountain/Plateau Desertscrub; FG = Foothills Grassland; J-P W = Juniper-Pinyon Woodland;VDS=ValleyDesertscrub; VG =Valley Grasslands; SD/P=Salt Desert/Playa; A/PV=Agriculture/Pastoral Valley; R/S= Rural/Suburban.

USFS SMS and VQO Compliance

Approximately 1.2 miles within the foreground of the proposed project would be constructed in the Cache National Forest. A segment of the Highway 39-Ogden River Scenic Byway also is located within the Cache National Forest; potential impacts on the scenic road are discussed in this section. According to the Wasatch-Cache National Forest LRMP, this portion of the Cache National Forest should maintain a natural appearing landscape character theme where the natural elements found in the landscape should dominate the majority of the views in the forest. Between approximately MPs 71.6 to 73.5 the forest adjacent to the pipeline alignment has a High Scenic Integrity Level, meaning that the landscape should appear intact and that any deviation from the natural should not be evident. Between MPs 73.5 and 76.2 the desired level of scenic integrity is moderate and any management activities should remain visually subordinate and not dominate the setting. The proposed project is on USFS land from approximately MPs 74.9 to 76.2. The proposed pipeline would meet with the SIO of Moderate Scenic Integrity in the foreground and middleground because it would not dominate the setting. Between approximate MPs 71.6 to 74.9 the landscape adjacent to the Cache National Forest would not appear intact and the level of contrast in line, form, and color from the removal of stands of dense evergreen trees could diminish the visual setting of the USFS lands. However, the proposed pipeline is not required to be consistent the USFS's management objectives because it is not on USFS land at that location.

Approximately 85 percent of the Fremont National Forest was inventoried to be natural appearing or slightly altered in 1985. Alterations have occurred in the Fremont National Forest over the past 2 decades; however, the 1989 Fremont National Forest LRMP designated the VQO of the majority of national forest lands within the foreground and middleground of the proposed project as a VQO of Partial Retention. Deviation from the natural landscape would be considered visually subordinate to the existing landscape character; therefore, the proposed pipeline would meet the management objectives. Additional site-specific mitigation at Rogger Meadow would be required to meet the foreground VQO of Partial Retention. The pipeline alignment at Rogger Meadow prevents long views along the alignment and the creation of irregular openings and additional plantings in the forested perimeter of the meadow would retain a natural appearing landscape. Small portions of the middleground of the proposed alignment in the Fremont National Forest have a VQO of Retention, but the alignment would most likely not be visible because of evergreen trees and other vegetation that would obscure the proposed pipeline. There are also some areas with a VQO of Modification near MP 608 within the middleground portion of the proposed pipeline. In this area, the proposed activities would comply with the management objectives because the proposed pipeline would not begin to dominate the landscape. It would still create a moderate level of contrast in form, line, and color within the mountainous forested landscape.

Scenic and Back Country Byways

Impacts on byways are described in terms of change in the visual character of the landscape setting for the byway and the potential to affect its designation. For each byway, temporary impacts from construction of the pipeline would include visibility of the construction area at road crossings and possible disruption of travel along the road. Temporary impacts are expected to last less than 6 weeks at each location and changes in the landscape character in the short-term would be reduced by restoration of construction sites.

Highway 39-Ogden River Scenic Byway

This byway is within the Mountain Conifer Mixed Forest Regional Landscape Character Unit and the roadway follows the Ogden River among tree-covered mountainsides. The proposed alignment crosses the byway at approximately MP 73.5. The byway is somewhat parallel within the foreground

distance zone of the proposed pipeline between MPs 70 to 73. Forest vegetation cover is variable with some open areas but views are often spatially enclosed because of the terrain and height of vegetation. In areas where the roadway would be parallel to the proposed project, the change in landscape character would be low. The landscape character at the crossing of the pipeline would have a moderate level of change. Head-on views of the proposed project would occur as the roadway winds through the landscape adjacent to the pipeline. The head-on views would have a moderate level of change in landscape character because the clearing of trees would have a moderate level of contrast and would attract attention. The views change quickly along the winding road and the cleared area for the pipeline would not dominate the view in the landscape. Clearing stands of trees would create a moderate level of contrast in the short-term because of the introduction of distinct lines in the landscape in both the foreground and middleground distance zones. The impacts would be reduced over the long-term as understory vegetation and trees become reestablished. The low level of impacts on the visual setting would not affect the designation of the road as a scenic byway with the implementation of the mitigation measures listed in table 4.8.4.7 and additional mitigation measures identified in Ruby's POD.

Transcontinental Railroad National Back Country Byway

The Transcontinental Railroad National Back County Byway is located in the Salt Desert/Playa Regional Landscape Character Unit and the terrain is very flat. The project would parallel a portion of the byway but would not cross it. The visibility analysis indicates that all of the pipeline within the foreground and 83 percent of the pipeline within the middleground would be visible from the byway. Project construction would introduce contrast in form line and color that would attract attention. The magnitude of change in landscape character would be low to moderate because most views from the byway would be parallel to the pipeline alignment. Impacts would be short- and long-term. As vegetation becomes reestablished the contrast between soil and vegetation cover would be evident.

Barrel Springs Back Country Byway

The proposed pipeline would cross the Barrel Springs Back Country Byway at approximately MPs 564 and 582. At MP 564 the byway is located within the Salt Desert/Playa Regional Landscape Character Unit, which is dominated by sagebrush. Steep juniper woodland hillsides are visible to the north in the middleground. The proposed project would follow an existing power line within the foreground and most of the middleground distance zones. The existing power line is visible approaching the pipeline crossing and attracts attention in the existing visual setting. Based on the visibility analysis, all of the proposed project in the foreground distance zone would be visible and approximately 70 percent of the proposed alignment within the middleground distance zone would be visible. There would be a low level of change in landscape character in the foreground and middleground and the visual contrast would be weak to moderate in the short term. The proposed pipeline would not attract attention and impact the existing visual setting of the byway in the long-term.

At MP 582 the byway is located within the Juniper-Pinyon Regional Landscape Character Unit, though the proposed pipeline alignment is located in an area dominated by desertscrub vegetation. The proposed project also is located along the existing power line at this location and the power line can attract attention in the existing visual setting. The alignment would not require juniper vegetation clearing in the foreground. Juniper vegetation would need to be cleared in the middleground; however, the clearing would be located adjacent to the clearing area maintained for the power line. There would be a low level of change in landscape character in the desertscrub area in the foreground and middleground and contrast would be weak in the short-term. The proposed pipeline would not attract attention and impact the existing visual setting of the byway in the long-term.

Oregon Outback National Scenic Byway

The proposed pipeline would cross the Oregon Outback National Scenic Byway at approximately MP 614. The existing visual setting is rural to the west of the byway with distinct lines and colors associated with agricultural fields as the dominant landscape elements. There also are residences and farm buildings along the byway which add interest and variation of color and texture but remain consistent with the rural character. To the east of the byway at the pipeline crossing the alignment ascends rolling terrain with grassland and sparse juniper vegetation. According to the visibility analysis, approximately 80 percent of the pipeline in the foreground would be visible from the byway and approximately 60 percent of the pipeline in the middleground would be visible from the byway. When viewed from the intersecting viewpoint, the proposed alignment would have a low to very low magnitude of change in the landscape character. The contrast of the lines and colors created by the pipeline construction would be weak and would blend with the existing rural character west of the byway. The rolling terrain on the east side of the byway would expose the proposed pipeline alignment to views from along the byway. The change in the existing landscape character would be low and would not attract attention because of the variety of distinct lines and vivid colors and would not impact the existing visual setting of the byway in the short-or long-term. The low magnitude of change in the landscape character would not affect the designation of the road as a scenic byway.

National Historic Trail System

Oregon National Historic Trail

The Oregon National Historic Trail is located in the Mountain/Plateau Desert Scrub Regional Landscape Character Unit The rolling terrain limits views from the trail corridor except when it is parallel to the pipeline alignment. Approximately 90 percent of the pipeline within the foreground would be visible from the trail and approximately 39 percent of the proposed pipeline in the middleground would be visible from the trail. The proposed pipeline would have a moderate change in the existing visual character as views from most viewing positions in the foreground and middleground would introduce noticeable contrasts of line, form, and color until vegetation begins to reestablish. The trail at the pipeline crossing would not be readily distinguishable from the surrounding landscape and the pipeline would become a noticeable feature in the landscape setting of the trail.

Oregon/California Auto Route

This segment of the Oregon/California Trail is in the Foothills Grassland Regional Landscape Character Unit and the magnitude of change in landscape character would be low to very low in the foreground and the middleground. The visibility analysis indicates that approximately 73 percent of the pipeline route in the foreground would be visible while the rolling terrain would allow approximately 38 percent of the pipeline in the middleground to be visible. The low level of change in landscape character and limited visibility in the middleground would not impact the recreational user's experience of the auto route in the short- long-term as vegetation becomes reestablished.

Emigrant Trail

The proposed pipeline alignment follows the existing road/trail route through the Salt Desert/Playa Regional Landscape Character Unit. The change in the landscape character would be low because the disturbance would be in the same corridor and the views from the trail would be parallel. Construction activities should not prevent use of the trail, and short-term impacts would include corridor

disturbance along the roadway. The construction would introduce contrasts in form, line, and color that would not attract attention in the long-term as vegetation becomes reestablished.

California National Historic Trail

This portion of the California Trail is located in the Mountain/Plateau Desert Scrub Regional Landscape Character Unit and the rolling terrain limits some opportunities to view the pipeline from the trail. The visibility analysis indicates that approximately 53 percent of the pipeline alignment in the middleground would be visible from trail. No part of the alignment is within the foreground distance zone. The construction of the proposed pipeline would result in a moderate change in the existing landscape character in the middleground because of the introduction of contrasts in form line and color to the landscape. The primary viewing position would be mostly parallel and impacts would be short- and long-term. The slight elevation change between the trail and the proposed pipeline would increase visibility, but impacts would be reduced more substantially than for head-on views as vegetation is reestablished.

Applegate-Lassen Trail

The Applegate Lassen Trail segment in the project area is located in the Salt Desert/Playa Regional Landscape Character Unit. Vegetation is fine-textured and dominated by saltbush and sagebrush and the soil color is very light. The visibility analysis indicates that approximately 36 percent of the pipeline in the foreground would be visible from the trail corridor and approximately 70 percent of the proposed pipeline in the middleground would be visible from the trail. A parallel view would have a very low magnitude of change in landscape character and opportunities for a head-on view are limited. Cleared areas would contrast to the existing vegetation in the short-term, but would not attract attention in the long-term because the vegetation would reestablish and the scale of view of the landscape draws the view to the middleground and beyond.

WSR System

As noted in section 4.8.3.3, a 2.2-mile portion of Twelvemile Creek is suitable for designation as a WSR with a classification as recreational. The suitable segment is managed as VRM Class II and the proposed alignment would cross at approximately MP 588.5. Under the recreational classification public use, forest practices and mining would be allowed, subject to regulations. These permitted activities could have impacts on the visual setting of Twelvemile Creek, though general use is low. The segment of the creek where the proposed alignment would cross consists of steep-banked, volcanic slopes and the coarse textured vegetation cover of the Juniper-Pinyon Woodlands Regional Landscape Character Unit. There is an existing power line across the creek at this location and towers are located near the edge of each bank of the creek. The magnitude of change in the landscape character would be moderate to high in the immediate vicinity of the crossing. The pipeline would introduce a strong contrast of line and moderate to strong contrast of color and texture on the steep slopes leading down to the creek. The visibility analysis indicates that approximately 46 percent of the pipeline within the foreground of the creek would be visible and approximately 45 percent of the portion within the middleground would be visible. The steep banks and meandering nature of the creek limit views of the proposed pipeline from outside the vicinity of the crossing. The change in visual character would attract attention in the short- and long-term, but would not be a dominant element in the landscape because the existing power line is highly visible from within a greater area of the viewshed of the creek.

4.8.4.7 Mitigation Measures

Mitigation measures to reduce the potential impacts on visual resources from the pipeline construction and maintenance have been identified from the visual resource technical report, the WWEC Programmatic EIS, and other resource areas examined in the EIS including soils, vegetation, and wetlands. Table 4.8.4-7 identifies general mitigation measures and those specific to the regional landscape character units as appropriate to meet Class III and Class IV VRM objectives. Additional, site-specific mitigation (such as slight adjustments to the alignment) would be required to further reduce visual resource impacts from pipeline construction and associated activities and meet land management objectives in Class I and II areas. Any micro-routing of the pipeline alignment would involve coordination with the appropriate agencies and resource specialists to avoid potential impacts on other resources. Additional mitigation measures are recommended for specific KOPs within Class III and IV areas to reduce visual impacts on sensitive locations. The site-specific mitigation measures would be developed based on the design and construction details provided by Ruby to the BLM in the POD, and approved by the BLM in its right-of-way grant.

4.8.5 Wilderness Resources

The proposed pipeline crosses lands administered and managed by the BLM, USFS, and the FWS for their respective wilderness characteristics as designated wilderness, WSAs, or Inventoried Roadless Areas. In addition to these designations, the Wilderness Act of 1964 and agency wilderness inventory guidelines define other lands as having wilderness characteristics. A number of areas with wilderness characteristics occur along or in proximity to the proposed pipeline. To ensure a consistent analysis of the effects of construction and operation of the Ruby pipeline along the proposed route, the BLM field and district offices in Wyoming, Utah, Nevada, and Oregon conducted a wilderness inventory of affected lands under BLM, USFS, and FWS jurisdiction to determine the presence of wilderness characteristics. This Wilderness Characteristic Assessment is included in Appendix W and was prepared entirely by the BLM.

As described in BLM's wilderness inventory, the effects of construction and operation of the project on wilderness characteristics would further decrease the amount of undeveloped landscapes along the pipeline route. The effects could also reduce naturalness in areas with wilderness characteristics by introducing unnatural or human-made objects to the landscape, and affecting or reducing the amount of soils, vegetation, or natural habitats in the region. Ruby would mitigate impacts on wilderness characteristics by employing several venues to notify wilderness users prior to visiting the affected wilderness units, including publication of the construction schedule in local media, posting the schedule at administering agency offices, posting the schedule at trailheads or other recreation access points to wilderness units, or other means of reaching visitors. This notification process would alert wilderness users to the potential temporary impacts of presence and sound of construction on opportunities for experiences of solitude in primitive recreation settings, and would allow visitors to decide if they want to reschedule their visit. Also, similar to the mitigation measures described in section 4.8.4.7, Ruby would feather the edges of shrubs and trees adjacent to the right-of-way when recontouring and revegetating the construction work areas in vegetation communities with a large shrub or tree component. These mitigation efforts would reduce the line/edge that would be apparent between the shrubs, trees, and grass of the reclaimed right-of-way.

TABLE 4.8.4-7

Visual Resource Mitigation Measures for the Ruby Pipeline Project

Regional Landscape Character Unit	Mitigation Measures
General Mitigation	• Work with the BLM to ensure that construction, operation, and maintenance of the pipeline and associated aboveground facilities would be consistent with the objectives and guidelines of VRM Class I, II, III, and IV areas. • Segregate topsoil from the trench line and spoil storage area for the entire length of the project. • In relatively level terrain, limit grading, topsoil segregation, and ditch line excavation to a minimum width for the pipeline trench. • Use seed mixes that include species similar to those currently residing in the natural plant communities of each state and would facilitate the recovery of the pre-construction plant community. • Limit the width of the construction right-of-way to 75 feet, and extra workspaces at least 50 feet away from wetland boundaries. • Use rock staining on exposed rock surfaces to blend with the surrounding rock formations. • Shape rock cut slopes to mimic adjacent rock formations. • Salvage surface boulders relocate in the disturbance area similar to preconstruction conditions and to reduce motorized travel into corridor. • Monitor the success of revegetation. • Develop a technical team to develop reclamation plans for each state crossed by the project. • Minimize the potential for erosion, and revegetate disturbed areas and spoil storage area for the entire length of the project. • Construction must minimize surface destruction. • Crossing must be located in areas where trail ruts have been modified by modern use, alongside a previously existing crossing, or where the crossing would not damage trail remains. • Trail crossing must avoid fragile trail resources. • Make road and trail crossings at a right angle to the road or trail unless it follows a previous crossing. • Where right-of-way is parallel to existing roads maintain 25 to 50 feet of undisturbed area adjacent to road surface. • Vegetative species (including trees and shrubs) indigenous to the project area must be used to rehabilitate right-of-way surface disturbance. • Disturbed areas must be returned to a natural contour. • Continue to coordinate with the BLM to align the pipeline to minimize direct and visual impacts on the trail. • Utilize BLM standard color palette for all above ground structures, except as required for safety.
Mountain Conifer/ Mixed Forest	• Remove infested trees in overstocked, infested stands prior to beetle emergence in early June to reduce potential for infestation. • Feather the edge of the right-of-way to minimize the linear impact created by right-of-way clearing. • Limit clearing of vegetation to 75 feet of the centerline. • Redistribute timber and slash across the right-of-way following final clean-up and seeded in areas. • Root wads would be piled and burned, with any unburned root debris buried. Non-merchantable pine and juniper should be yarded to permit public firewood cutting along Willow Valley road, and any intersecting roads. • Reforest cleared areas in forests, except for the 50-foot pipeline operational right-of-way. • Consult with the appropriate land managing or state agencies to develop plans for revegetating wetlands. • Use additional clearing of vegetation and trees in forested and juniper-pinyon areas to create uneven, natural appearing openings in vegetation cover adjacent to the pipeline area. • Reseeding mixtures to include forest understory species based on specific forested vegetation communities. • Leave existing root systems intact where possible to encourage regrowth and revegetation along the equipment passage and soil storage areas.
Mountain/ Plateau Desertscrub	• Minimize the potential for erosion, revegetate disturbed areas. • Leave existing root systems intact where possible to encourage regrowth and revegetation along the equipment passage and soil storage areas. • Feather the edge of the right-of-way to minimize the linear impact created by right-of-way clearing • Limit clearing of vegetation to 75 feet of the centerline. • Control nighttime lighting at compressor sites by shielding and down-casting lights as practicable. • Landscape the areas with native shrubs and grasses to visually blend with adjacent areas. • Aboveground facilities to match the existing landscape colors as closely as possible. • Revegetate the right-of way to minimize visual fragmentation impacts while sagebrush is allowed to recover and repopulate the right-of-way. • Redistribute timber and slash across the right-of-way following final clean-up and seeded in areas. • Incorporate “pitting” and “vertical mulching” to discourage vehicle travel in disturbed pathways.

TABLE 4.8.4-7

Visual Resource Mitigation Measures for the Ruby Pipeline Project

Regional Landscape Character Unit	Mitigation Measures
	Pitting would include decompacting soil by digging pits roughly 1 to 2 feet apart and 6 to 12 inches deep to encourage collection of windblown seeds and to help collect water. Vertical mulching is accomplished by 'planting' dead vegetation and rocks in the route to obscure it from view.
Foothills Grasslands	• Minimize the potential for erosion, revegetate disturbed areas. • Control nighttime lighting by shielding and down-casting lights as practicable.
Juniper-Pinyon Woodlands	• Feather the edge of the right-of-way to minimize the linear impact created by right-of-way clearing. • Limit clearing of vegetation to 75 feet of the centerline. • Reforest cleared areas in forests, except for the 50-foot pipeline operational right-of-way. • Root wads would be piled and burned, with any unburned root debris buried. Non-merchantable pine and juniper should be yarded to permit public firewood cutting along Willow Valley road, and any intersecting roads. • Create natural openings to reduce the contrast between the right-of-way and surrounding tree growth. • Leave existing root systems intact where possible to encourage re-growth and revegetation along the equipment passage and soil storage areas. • Redistribute timber and slash across the right-of-way following final clean-up and seeded in areas. • Additional clearing of vegetation and trees in forested and juniper-pinyon areas would be used to create uneven, natural appearing openings in vegetation cover adjacent to the pipeline area.
Valley Desertscrub	• In relatively level terrain, limit grading, topsoil segregation, and ditch line excavation to an approximate to minimum required for pipeline trench. Trample/cut and retain existing vegetation where possible. • Revegetate the right-of way to minimize visual fragmentation impacts while sagebrush is allowed to recover and repopulate the right-of-way. • Leave existing root systems intact where possible to encourage regrowth and revegetation along the equipment passage and soil storage areas. • Feather the edge of the right-of-way to minimize the linear impact created by right-of-way clearing. • Incorporate "pitting" and "vertical mulching" to discourage vehicle travel in disturbed pathways. Pitting would include decompacting soil by digging pits roughly 1 to 2 feet apart and 6 to 12 inches deep to encourage collection of windblown seeds and to help collect water. Vertical mulching is accomplished by 'planting' dead vegetation and rocks in the route to obscure it from view.
Salt Desert/Playa	• Control nighttime lighting by shielding and down-casting lights. • Landscape facility areas with shrubs to provide visual blending with adjacent areas. • Aboveground facilities to match the existing landscape colors as closely as possible. • In relatively level terrain, limit grading, topsoil segregation, and ditch line excavation to an approximate to minimum required for pipeline trench. Trample/cut and retain existing vegetation where possible. • Revegetate the right-of way to minimize visual fragmentation impacts while sagebrush is allowed to recover and repopulate the right-of-way. • Leave existing root systems intact where possible to encourage regrowth and revegetation along the equipment passage and soil storage areas. • Incorporate "pitting" and "vertical mulching" to discourage vehicle travel in disturbed pathways. Pitting would include decompacting soil by digging pits roughly 1 to 2 feet apart and 6 to 12 inches deep to encourage collection of windblown seeds and to help collect water. Vertical mulching is accomplished by 'planting' dead vegetation and rocks in the route to obscure it from view.

4.8.6 Non-Jurisdictional Electric Power Lines

The Rocky Mountain Power and Harney Electric Cooperative electric transmission and distribution lines would be routed through open sagebrush range. The Rocky Mountain Power facilities would require new right-of-way across about equal amounts of private land and land administered by the BLM. The Harney Electric Cooperative facilities would be collocated with an existing power line entirely on BLM-administered land. Construction of the new lines would not change the general use of the land, but would preclude construction development within the permanent right-of-way. No recreation-dedicated features or facilities (trails, back country byways, visitor centers, *etc.*) have been identified along the electric line routes. Land use and recreation impacts due to the proposed work would not be significant.

The electric transmission and distribution lines do not cross visually sensitive areas. Where the lines are on BLM-administered land, they are in VRM Class IV areas, which allow activities that require major modification of the landscape. The Rocky Mountain Power lines would be located in a landscape already occupied by power lines, large compressor stations, and roads. The Harney Electric Cooperative distribution line would be routed next to an existing distribution line. Construction activity and equipment would temporarily be seen by viewers in close proximity to the right-of-way, including recreationalists and motorists on public roadways. Permanent scenic impacts would occur from the installation of power poles and lines. The overall visual contrast of the electric lines would be moderate to low. Visual impacts due to the proposed work would not be significant.

4.9 SOCIOECONOMICS

4.9.1 Population and Employment

The Ruby Pipeline Project would begin at the existing Opal Hub in Lincoln County, Wyoming and would terminate at an existing pipeline facility near Malin in Klamath County, Oregon. The pipeline right-of-way would cross 10 counties in the states of Wyoming, Utah, Nevada, and Oregon, and would be supported by numerous aboveground facilities, including the following four compressor stations:

- the Roberson Creek Compressor Station in Lincoln County, Wyoming, at MP 5.7;
- the Wildcat Hills Compressor Station in Box Elder County, Utah, at MP 172.5;
- the Wieland Flat Compressor Station in Elko County, Nevada, at MP 330.2; and
- the Desert Valley Compressor Station in Humboldt County, Nevada, at MP 476.4.

We have assumed that the general socioeconomic impact area for the project would be the area within a 50-mile radius (approximate 1-hour travel time) to and from the project area. Table 4.9.1-1 provides a summary of selected socioeconomic and demographic statistics for the states and counties crossed by the proposed project.

Construction work areas for the project generally would be located in unpopulated areas or areas with low population density. The primary exception to this is Cache County, Utah, near Interstate 84 and Interstate 15 in Brigham City. Ogden, Utah, which lies approximately 15 miles south of the project is the only major metropolitan area with a population over 50,000 that would be within a 50-mile radius of the project. Population densities in the remaining counties are under 12 persons per square mile.

TABLE 4.9.1-1

Existing Socioeconomic Conditions for States and Counties Crossed by the Ruby Pipeline Project

State/County	Population[a]	Population Density (persons/square mile)	Per Capita Income[b]	Civilian Labor Force[c] (persons)	Unemployment Rate[d] (percent)	Major Industries[b]
WYOMING	532,668	5.5	$47,047	292,606	3.1	Retail Trade, Healthcare and Social Assistance
Lincoln	16,631	4.1	$40,373	8,329	3.5	Retail Trade, Mining
Uinta	20,617	9.9	$42,621	11,565	3.0	Mining, Healthcare and Social Assistance
UTAH	2,736,424	33.3	$29,831	1,383,743	3.4	Retail Trade, Manufacturing
Rich	2,205	2.1	$26,465	1,441	2.5	Accommodation and Food Services, Real Estate
Cache	112,616	96.7	$22,874	61,146	2.7	Manufacturing, Healthcare and Social Assistance
Box Elder	49,015	8.6	$25,898	24,112	3.9	Manufacturing, Retail Trade
NEVADA	2,600,167	23.7	$39,853	1,373,462	6.7	Accommodation and Food Services, Retail Trade
Elko	47,071	2.7	$34,869	27,030	4.2	Mining, Accommodation and Food Services
Humboldt	17,763	1.8	$30,687	8,002	4.9	Mining, Accommodation and Food Services
Washoe	69,044[e]	11.0[e]	$45,410	32,376[e]	6.8	Accommodation and Food Services, Retail Trade
OREGON	3,790,060	39.5	$35,143	1,957,953	6.4	Retail Trade, Manufacturing
Lake	7,239	0.9	$26,571	3,606	8.5	Manufacturing, Healthcare and Social Assistance
Klamath	66,425	11.2	$28,050	31,043	9.0	Retail Trade, Healthcare and Social Assistance

a U.S. Census Bureau, 2008a.
b U.S. Bureau of Economic Analysis, 2007.
c U.S. Census Bureau, 2008b.
d BLS, 2009.
e Does not include data from the City of Reno, which is outside of the 50-mile radius of the project impact area.

The major industries in the counties that would be traversed by the project include retail trade, mining, accommodation and food services, manufacturing, healthcare and social assistance, and real estate. The county with the highest per capita income along the pipeline route is Washoe County, Nevada, at $45,410, which is partly due to the population center around Reno. Reno is about 140 miles south of the project area and county-wide data minus the impact from Reno was not available. Cache County, Utah, has the lowest per capita income at $22,874. With the exception of Washoe County the per capita income for each county that would be crossed by the pipeline is less than each respective state's per capita income.

Five of the 10 affected counties experience a higher unemployment rate than their state average. The most recent county-specific data published by the Bureau of Labor Statistics are for 2008; however, a review of seasonally adjusted unemployment rates for affected states in October 2009 revealed higher state-wide rates of unemployment. Unemployment rates for Wyoming, Utah, Nevada, and Oregon were 6.8 percent, 6.2 percent, 13.3 percent, and 11.5 percent, respectively (BLS, 2009). It is possible that current county-wide unemployment rates have risen above the most recently published levels.

Ruby would use seven spreads during construction, each approximately 80 to 120 miles long (see Appendix X, Figure 1). Construction on each spread would proceed as one continuous operation lasting approximately 10 months. Construction would require 400 to 500 workers per spread for a peak pipeline workforce of about 3,500 persons. Construction of the four compressor stations would require 150 to 200 workers per station for a peak station workforce of about 800 persons. Table 4.9.1-2 presents the workforce estimates for the project. Ruby anticipates that construction activities could commence sometime in early spring 2010 in areas where weather allows and where there are no restrictions designated to protect sensitive species, species that are migrating, or cultural resources. Ruby's estimated in-service date for all facilities is March 2011.

TABLE 4.9.1-2

Estimated Construction Workforce for the Ruby Pipeline Project

Facility/Activity	Approximate Number of Workers (Local and Non-Local)
PIPELINE FACILITIES	
Peak Construction Workforce (Total)	3,500
Peak Construction Workforce (Per Spread)	500
Average Construction Workforce (Total)	2,800
Average Construction Workforce (Per Spread)	400
COMPRESSOR STATIONS	
Peak Construction Workforce (Total)	800
Peak Construction Workforce (Per Station)	200
Average Construction Workforce (Total)	600
Average Construction Workforce (Per Station)	150
Peak Construction Workforce	**4,300**
Average Construction Workforce	**3,400**

Temporary population increase based on work influx would be expected in the affected counties and their communities. Ruby estimates that up to 15 percent of the workforce would be local hires and about 85 percent would be non-local. Therefore, during the peak of construction, up to 645 workers would be local hires and 3,655 workers would be non-local (pipeline and compressor station work combined). This would equate to about 75 local and 425 non-local workers per construction spread, and about 30 local and 170 non-local workers per compressor station during peak periods. A brief decrease in

unemployment could occur as a result of hiring about 645 local workers for construction. Due to the transitory nature and short duration of pipeline construction, we would not expect most non-local workers to travel with their families.

Ruby stated that it would employ 19 permanent employees for operation and maintenance of the pipeline and compressor stations. Two permanent employees would be needed to operate each compressor station, and approximately 11 employees would be needed for pipeline operation and maintenance. Employees associated with the compressor stations most likely would reside in Lincoln or Uinta counties, Wyoming; Box Elder County, Utah; and Elko or Humboldt counties, Nevada. Employees associated with pipeline operation and maintenance most likely would reside near Ruby's corporate offices in Colorado Springs, Colorado.

We received comments on the draft EIS requesting that specific socioeconomic impacts associated with the Vya Construction Camp and Lakeview Temporary Housing Facility be addressed in the final EIS. Table 4.9.1-3 provides a summary of select socioeconomic and demographic statistics for the Vya camp area, including data for Washoe County (Nevada), Modoc County (California), and the California communities of Cedarville, Eagleville, Fort Bidwell, and Lake City. Data for these California communities were included in table 4.9.1-3 due to the proximity of the Vya camp to California. Table 4.9.1-4 provides a summary of select socioeconomic and demographic statistics for the Lakeview facility area, including data for the State of Oregon, Lake County, and the Town of Lakeview.

TABLE 4.9.1-3

Existing Socioeconomic Conditions in the Vicinity of the Vya Construction Camp

Location	Population[a,f]	Population Density (persons/sq. mile)	Per Capita Income[b,f]	Civilian Labor Force (persons)[c,f]	Unemployment Rate[d,f] (percent)	Major Industries[b]
Washoe County, NV	69,044[e]	11.0[e]	$45,410	32,376[e]	6.8	Accommodation and Food Service, Retail Trade
Modoc County, CA	9,184	2.3	$27,842	3,992	9.7	Agriculture, Public Administration, Education, Health and Social Services
Cedarville /Eagleville, CA	849	3.2	$20,360	408	7.4	Agriculture, Public Administration, Education, Health and Social Services
Lake City, CA	112	2.4	$19,446	80	5.6	Agriculture, Education, Health and Social Services
Fort Bidwell, CA	214	1.9	$13,782	76	8.4	Education, Public Administration, Agriculture

a U.S. Census Bureau, 2008a
b U.S. Bureau of Economic Analysis, 2007
c U.S. Census Bureau, 2008b
d BLS, 2009
e Does not include data from the City of Reno, which is outside of the 50-mile radius of the project impact area.
f The United States does not define census-designated places for Cedarville, Eagleville, Lake City, or Fort Bidwell. However, the U.S. Census Bureau does define Zip Code Tabulation Areas (ZCTA) 96104 (containing Cedarville and Eagleville), 96115 (Lake City), and 96112 (Fort Bidwell). The socioeconomic data for these three zip codes were used to depict existing conditions in these towns.

TABLE 4.9.1-4

Existing Socioeconomic Conditions in the Vicinity of the Lakeview Temporary Housing Facility

State/County/Town	Population[a]	Population Density (persons/sq. mile)	Per Capita Income[b]	Civilian Labor Force (persons)[c]	Unemployment Rate[d] (percent)	Major Industries[b]
OREGON	3,790,060	38.5	$35,143	1,957,953	11.5	Educational, Health and Social Services; Manufacturing; Retail Trade
Lake County	7,239	0.89	$26,571	3,606	8.5	Agriculture; Educational, Health and Social Services; Manufacturing
Town of Lakeview	2,427	1,553	$19,025	1,083	6.6	Educational, Health and Social Services; Manufacturing; Retail Trade

a U.S. Census Bureau, 2008a (Lake County and State of Oregon); www.city-data.com (Town of Lakeview, 2008 data).

b U.S. Bureau of Economic Analysis, 2007 (Lake County and State of Oregon); www.city-data.com (Town of Lakeview, 2007 data).

c U.S. Census Bureau, 2008b (Lake County and State of Oregon); U.S. Census Bureau, 2000 Census (Town of Lakeview).

d BLS, 2009 (Lake County, 2008 data) (State of Oregon, 2009 seasonally adjusted data); www.city-data.com (Town of Lakeview, 2007 data).

Population densities are low in the vicinity of the proposed Vya Construction Camp. Cedarville, California has a population of 849 and is the closest community to the Vya camp. The region relies on agriculture, public administration, education, health and social services, and retail trade as major employing sectors. Recent economic conditions have been weak, as shown by the preliminary June 2009 unemployment rates for Modoc and Washoe (without Reno) counties. We received comments during the draft EIS comment period regarding potential employment opportunities associated with the Vya camp. Ruby has indicated that approximately 28 full-time workers would be hired to support construction workers lodging at the camp, and that their intent would be to hire some of the workers locally.

The Town of Lakeview has an estimated population of 2,427, accounting for one third of the county's total population. The economy of Lake County is anchored by timber and wood products, government offices, and agriculture. In addition, recreation, tourism, manufacturing, and retail trade are also important sectors (LCC, 2009). Incomes are below the Oregon State average. The unemployment rate provided for Lake County in the table above was obtained from 2008 data. As a result of the recent economic downturn, current estimates indicate that Lake County's unemployment rate climbed as high as 17.5 percent in February 2009, but then declined to 10.1 percent by July 2009.

We do not anticipate that Ruby would hire many local workers to support the Lakeview Temporary Housing Facility because, based on the information Ruby has provided to date, it does not appear this facility would be self-sufficient like the Vya Construction Camp. Workers staying at the Lakeview facility would be required to obtain their own food and supplies, and would therefore purchase these goods and services from local vendors in the Town of Lakeview.

4.9.2 Housing

The temporary influx of non-local construction workers would increase demand for housing, resulting in increased revenues to individuals and businesses with space for rent. Temporary housing in the project area is available in the form of daily, weekly, and monthly rentals at motels, hotels, casino hotels, campgrounds, RV parks, bed-and-breakfasts, boarding houses, apartments, and houses. The availability of these accommodations may vary, particularly during any tourist season, local event, or as a result of demand for housing by other industries (*e.g.*, mining). Information regarding temporary accommodations in affected counties is presented in table 4.9.2-1. This information reflects the housing pressures currently applied by area industries, including mining.

TABLE 4.9.2-1

Vacant Accommodation Housing Units for the Ruby Pipeline Project

State/County	Rental Vacancy Rate[a] (percent)	Vacant Housing Units for Rent[a]	Hotels and Motels[b]	RV Parks and Camps[b]
WYOMING				
Lincoln	21.8	275	17	1
Uinta	17.7	363	10	0
UTAH				
Rich	41.2	73	2	2
Cache	4.4	446	14	3
Box Elder	7.5	212	9	3
NEVADA				
Elko	16.9	954	43	5
Humboldt	19.7	381	18	2
Washoe[c]	7.4	317	23	0
OREGON				
Lake	12.6	139	8	1
Klamath	8.5	747	30	6

a U.S. Census Bureau, 2000a.
b U.S. Census Bureau, 2006.
c Does not include data from the City of Reno, which is over 50 miles from the project area.

It is also likely that non-local workers would seek accommodations in counties and communities not directly affected by the pipeline but within a reasonable commuting distance (50 miles) of contractor yards. Ruby stated that many workers would drive personal vehicles to contractor yards each day before the start of work for busing from the contractor yards to the right-of-way. Counties within 50 miles of the contractor yards include Summit, Morgan, Weber, Davis, Salt Lake, and Tooele in Utah; Franklin, Oneida, Bannock, Bear Lake, and Caribou in Idaho; Eureka, Lander, and Pershing in Nevada; Sublette and Sweetwater in Wyoming; Lassen and Modoc in California; and Harney in Oregon. Information regarding temporary accommodations in these counties is presented in table 4.9.2-2.

The incremental temporary housing demand from construction workers, per spread, would be distributed over a large area and would be short-term. However, the combined demand for temporary housing from tourists, recreationalists, local workers, and project construction crews could at times exceed the supply in some communities. While this would benefit the proprietors of the local motels,

hotels, casinos, RV camps, and other rental units, it could result in the short-term unavailability of such temporary housing for some tourists, recreationalists, or local workers.

We received comments on the potential effects of construction workforce demands on temporary housing, particularly near Elko, where pipeline workers would compete with mine workers for housing. Mining is the primary industry in Elko and Humboldt counties, and it is likely that rental units are already heavily used by mining workers. Nearby counties such as Lander, Eureka, and Pershing have comparatively high rental vacancy rates (table 4.9.2-2), and vacancy rates in the area suggest that existing lodging facilities would be sufficient to meet the demand required by the Ruby construction workforce. If project demand for temporary housing were to exceed supply, project workers would be required to find accommodations in communities further from the project area, resulting in longer daily driving distances.

TABLE 4.9.2-2

Vacant Accommodation Units in Counties Within 50 Miles of Contractor Yards for the Ruby Pipeline Project

State/County	Rental Vacancy Rate[a] (percent)	Vacant Housing Units for Rent[a]	Hotels and Motels[b]	RV Parks and Camps[b]
UTAH				
Summit	13.6	397	24	3
Morgan	4.0	10	0	0
Weber	8.6	1,555	27	4
Davis	5.6	953	17	3
Salt Lake	6.4	6,291	127	4
Tooele	13.2	417	7	0
IDAHO				
Franklin	4.6	32	3	1
Oneida	5.6	15	0	0
Bannock	8.4	728	21	4
Bear Lake	12.8	57	4	3
Caribou	28.9	214	4	0
NEVADA				
Eureka	37.9	107	1	0
Lander	32.4	229	5	0
Pershing	25.7	207	5	0
WYOMING				
Sublette	7.4	51	12	7
Sweetwater	16.2	681	19	2
CALIFORNIA				
Lassen	13.4	473	13	3
Modoc	9.3	114	8	2
OREGON				
Harney	15.8	156	8	1

a U.S. Census Bureau, 2000a.
b U.S. Census Bureau, 2006.

The Vya Construction Camp would provide living quarters for up to 650 non-local pipeline workers. The Vya camp would accommodate the workers on Spreads 4A, 4B, 5, and 6B. The proposed camp would be located on a 160-acre private property parcel in Washoe County, Nevada (approximately 6 miles west of MP 558). Approximately 80 acres of the camp would be used for worker lodging, RV facilities, and other associated facilities. The remaining 80 acres would not be developed (see Appendix P for a diagram of the proposed camp layout). The camp would be capable of housing approximately 425 people in temporary modular-type structures. The facility also would include temporary pads for parking that could accommodate up to 200 RV trailers. Since the existing site is relatively flat, grading would be kept to a minimum and would only be necessary to place the modular structures and to create flat parking pads for the RVs.

Ruby's camp contractor would be responsible for providing the modular units and temporary trailer pads, along with food services, septic services, solid waste removal, water, and security. Electricity would be supplied to the camp by four self-contained, noise-attenuated, trailer-mounted Caterpillar diesel power generation units (one 2-MW unit and three 1-MW units). Electricity would be distributed from the generators to modular housing units and the RV hookups via underground electric lines installed per the Nevada electrical code. Residents of the temporary RV camp would use gas for cooking.

Ruby plans to store propane (approximately 10,000 gallons), off-road diesel fuel (10,000 gallons), over-the-road diesel fuel (5,000 gallons), and unleaded gasoline (5,000 gallons) at the camp. Propane would be stored in a propane tank, and diesel fuel and gasoline would be stored in tanks within secondary containment structures, which would be bermed and lined in accordance with county, state, and/or federal permitting requirements.

One water well currently exists on the southeastern portion of the parcel. Ruby would use this well for potable water supply. Ruby already has obtained a permit for this well from the State of Nevada, Division of Water Rights (permit number 78382) (see section 4.3.1.3 for additional information on this well).

A wastewater system would be created on-site at the camp for the lodging units. The wastewater system would be designed as a typical septic tank with a grease trap for the kitchen facilities, in accordance with State of Nevada and Washoe County permitting requirements. In addition, a downstream sewage leach field would be installed, with the final design dependant on the results of percolation testing at the site, and would be permitted according to State of Nevada requirements. Three septic holding tanks would be provided for recreational vehicle users; the septic holding tanks would be regularly inspected and, as needed, wastes removed and discharged at a sanitary disposal facility in Reno.

Solid waste from the camp would be collected in on-site, roll-off containers. Ruby estimates that a single 30-cubic-yard, roll-off container would be sufficient to manage solid waste for a week; however, Ruby's current plan is to utilize two containers that would be emptied weekly by a waste management service that would haul the refuse to a licensed landfill for disposal in Alturas, California.

Ruby stated that it would coordinate the camp construction and operations with the towns of Cedarville and Alturas (California) and other communities in Surprise Valley (California) and Long Valley (Nevada). Based on Ruby's currently projected construction schedule, construction of the camp would begin in spring 2010 and would last for approximately 10 weeks. The camp would begin operation in summer 2010 and continue through December of 2010. Decommissioning would ensue after the workers leave in December of 2010, and would be completed by the third quarter of 2011. During decommissioning, the camp would be completely dismantled and all facilities would be removed. The land surface would be regraded as necessary, cleaned-up, and restored to preconstruction conditions in

accordance with Ruby's Plan and landowner preference. All construction camp improvements would be removed from the site no later than the third quarter of 2011, assuming Ruby's anticipated construction schedule is implemented.

The Lakeview Temporary Housing Facility would be located in Lake County, Oregon, west of the city limits of the Town of Lakeview (see Appendix P). The Lakeview facility would accommodate the workers necessary for construction on Spread 4 of the project. The facility site encompasses approximately 15.4 acres of open space. The parcel is presently divided into segments by poorly constructed barbed wire fences and man-made drainage ditches. The previous land use of this area was used for cattle grazing and possibly agriculture. The facility would include nine portable housing modules, each containing 49 units, although some units would be used for storage and not occupied by workers. Ruby estimates that up to 350 personnel could occupy the Lakeview facility during construction.

Ruby's contractor would be responsible for providing the modular housing units. Electric power to the housing units would be provided by an electric feed line from an existing power line located at the southeastern corner of the site. Water and sewer would be provided by existing municipal water and sewer infrastructure. The Town of Lakeview has indicated it has sufficient capacity to provide water and sewer services to the Lakeview facility. Lakeview Sanitation would provide dumpsters at several locations within the temporary housing site and provide weekly garbage collection services.

4.9.3 Public Services

A wide range of public services and facilities are available within the project area including law enforcement agencies, fire departments, medical facilities (including hospitals and emergency services), and schools. The level of demand on local public services that would result from project construction would vary from community to community, depending on the number of non-local workers temporarily residing in each location, the duration of their stay, and the size of the community.

Other potential construction-related demands on local services would include increased demand for permits for vehicle load and width limits, local police assistance during construction at road crossings to facilitate traffic flow, and emergency medical services to treat injuries resulting from construction accidents. Based on the general remoteness of the work areas, the relatively short timeline for construction-related activities, and the estimated speed at which the project would move across the construction areas, most non-local workers are not expected to bring families or children with them to the construction spreads; therefore, little to no impact on schools or education resources are expected. Ruby would work with local law enforcement, fire departments, and emergency medical services to coordinate for effective emergency response. Ruby anticipates that the construction timeframe would fall within seasons with increased risk for rangeland fires; therefore, Ruby has developed a Fire Prevention and Suppression Plan (Appendix H) that includes measures for coordinating with local fire department services.

We received a comment on the draft EIS from Washoe County, Nevada, stating that the Fire Prevention and Suppression Plan contained inaccurate information regarding the emergency personnel to be notified in the event of a fire. Ruby committed to revising its plan, as appropriate. We also received a comment concerning the overall inadequacy of the plan in Washoe County. In response, Ruby filed an updated Fire Prevention and Suppression Plan to address identified deficiencies. However, we believe that the current plan still lacks detail and clarity with regard to notification procedures and responsibilities. Therefore, **we recommend that Ruby coordinate with all jurisdictional fire response authorities affected by the project to revise its Fire Prevention and Suppression Plan to meet the**

standards of those authorities. The revised plan, along with any agency comments on the plan, shall be filed for review and written approval of the Director of OEP prior to construction.

We received comments on the potential effects of construction workforce demands on public services, particularly near Elko where pipeline workers would compete with mining companies for services. Elko County public services include a Sheriff's Department, the Northwestern Nevada Regional Hospital, and city and county fire and police services. Mining is a well-established industry in Elko County and the services currently provided by the county and its cities serve the mining industry adequately. Because the non-local workforce would be small relative to the current population, we believe that construction of the pipeline would result in minor and temporary impacts on local facilities and services in and around the Elko area.

We also received comments on the potential benefits that the availability of gas utility service would provide to local communities. Natural gas distribution to local communities is the final step in delivering natural gas to end-users. While some large industrial, commercial, and electric generation customers receive natural gas directly from high-capacity interstate pipelines like the Ruby pipeline, most end-users receive natural gas from a local distribution company. Local distribution companies typically transport natural gas from delivery points along interstate pipelines to local businesses and residences through a network of lower pressure, small-diameter distribution pipelines. Ruby stated that its pipeline is capable of delivering gas to local distribution companies in the communities through which it passes. However, Ruby's open season did not result in contracts with local distribution companies for gas transportation service. If future delivery of gas to local distribution companies were necessary, Ruby would be required to seek appropriate regulatory approvals at that time, including any authorizations that might be required from the FERC to modify or expand its facilities.

We received comments regarding the potential for increased demand on the Sheldon NWR staff for policing, fire protection, and clean-up associated with increased use of the Sheldon NWR by non-local workers. As discussed in section 4.8.3.5, a substantial increase in use of the Sheldon NWR and demand on staff is not expected. Construction workers would be on the project site during the day and, due to the nature of pipeline construction and the demanding work schedule (6 to 7 days per week, 10 to 12 hours per day), workers likely would not use the Sheldon NWR for recreation on their days off. If construction workers chose to use and explore the Sheldon NWR on their own time, the workers would be under the same restrictions as the general public.

We received several comments during the draft EIS comment period on the effects of the Vya Construction Camp on public services in Modoc County, California (the closest community to the camp). Ruby met with public officials from Modoc County and the California cities of Cedarville and Alturas in July and August 2009 to discuss the project needs and public service impacts. Local community leaders invited Ruby to visit their medical facilities and to discuss anticipated construction-related medical needs. As a result of these meetings, the local medical community stated it would be able to provide any necessary emergency medical services. Ruby also met with local fire departments, reviewed their equipment, and is currently in discussion with the local fire departments regarding opportunities to lease idle fire equipment for use at the Vya camp. As a result of these meetings, an informal communication team of Ruby and local public service officials has been established that would develop a plan for effective communication and coordination in the event of an emergency.

Ruby has indicated that a physician's assistant would be employed on site by the construction contractor at the Vya Construction Camp to provide basic first aid and limited medical care to camp residents. An area would be made available at the camp for potential use by a helicopter to transport patients to the Sunrise Valley Hospital or the Modoc Medical Center. Due to the short duration of construction, any increased demands on medical services would be temporary. Further, historic accident

data from pipeline construction show a low incidence of worker injuries and fatalities. From 1989 to 2008, an average of 8 serious pipeline incidents (defined as an event involving a fatality or injury requiring in-patient hospitalization) per year occurred on natural gas transmission and gathering lines nationwide (PHMSA, 2009). Therefore, even assuming that average incident rates apply, it is unlikely that more than a few workers would require emergency service or medical attention during the time the Vya camp is in operation. The hospitals and medical service providers in the local area are not expected to be unduly burdened by this relatively small incremental demand.

Modoc County has 15 fire departments serving its residents. These departments function under the auspices of the City of Alturas, California Pines Community Service District, Fort Bidwell Indian Community, and 12 additional fire protection districts (3 of which operate jointly in Modoc and a neighboring county). Nearly all fire fighters are volunteers. Generally, these departments are responsible for all structural fire fighting within their district boundaries. The departments are also responsible for wildland fires within the "Local Responsibility Areas" of their districts. Non-local responsibility for wildland fires falls to the California Department of Forestry and Fire Protection. Responsibility for wildland fires on federal lands are the responsibility of the USFS and/or the BLM. Fire protection services may be required, depending on the time of year and the potential for rangeland/grassland fires. Fire prevention services would be available on site at the camp for small emergencies and would follow the protocols of Ruby's Fire Prevention and Suppression Plan (see Appendix H). Construction of the camp would include installation of two 13,000-gallon water storage tanks for fire fighting and a rented pumper engine to handle any potential fire emergencies at the camp. Construction crews and employees at the camp would be required to adhere to all hazard and safety requirements to mitigate the potential for fire along the route. Fire department services may also be called upon for construction injuries or accidents.

Six ambulance services cover portions of Modoc County: Surprise Valley Health Care; Modoc Medical in Alturas and Adin; Mayers Memorial Hospital out of Fall River Mills; Basin Ambulance out of Merrill, Oregon; and Lakeview Ambulance based in Lakeview, Oregon. In addition, several fire departments operate medical aid units. Information regarding currently active units and response areas is maintained by the Modoc County 9-1-1 Coordinator. Trauma cases, as well as serious illness cases, must be sent to hospitals in Fall River Mills, Redding, Klamath Falls, or Reno/Sparks. Transport in emergency situations is usually by air ambulance (*i.e.*, helicopter).

Police services are covered under the Modoc County Sheriff's department and the City of Alturas Police Department. In addition, Ruby has committed to staffing security at the entrance to the Vya Construction Camp 24 hours a day. The camp also would be gated and surrounded with barbed wire so that only approved workers would have access. Ruby is working with local law enforcement agencies to ensure that security would be adequate to meet the needs of the camp without creating an undue burden on the surrounding community. Appendix P provides additional information regarding police and emergency service personnel in Modoc County.

We received comments on the draft EIS concerning the protection of people and resources located in the areas surrounding the camp. Ruby stated that it would require each construction camp occupant to read and sign orientation documents that would contain information, including use restrictions, regarding the surrounding communities and areas. Ruby would hold its contractors accountable for compliance. Ruby has also stated that it welcomes input from any agencies that would like specific information included in the orientation information. Ruby also plans to invite representatives from the local area (such as the sheriff's office and state highway patrol) to speak at the worker training sessions.

Ruby does not anticipate that a significant percentage of family members would accompany construction workers during the project, and no school-age children would be allowed to lodge at the Vya Construction Camp. Thus, we conclude there would be no project-related impact on area schools.

Similar to the Vya Construction Camp, the Lakeview Temporary Housing Facility potentially would impact public services. Medical care near the housing facility site is provided by Lake District Hospital. Lake District Hospital services include acute care, obstetrical services, surgery, emergency room, and related ancillary services (lab, x-ray, *etc.*). Twenty-four-hour emergency services are provided and air ambulance facilities and services are also available. An Federal Aviation Administration Helipad is located on campus and fixed wing transport via Lake County Airport is also available. Ambulance services are provided by volunteer emergency service technicians and workers operating through the Lakeview Disaster Unit, Paisley Disaster Unit, and the North Lake County Disaster Unit (Lake District Hospital, 2009). Ruby and its contractors are committed to operating safely to minimize the possibility of accidents and injuries. The hospitals and medical service providers in the local area are not expected to be unduly burdened by this relatively small incremental demand.

The Lakeview Fire Department serves approximately 5,000 people living in a 54-square-mile area. The fire department provides firefighting, hazardous material response, and vehicle rescue (extrication) services. The fire department (a public department with both paid and volunteer members) operates out of one station and is made up of three divisions: (1) the professional fire department, (2) the volunteer fire department, and (3) the rural fire department. The professional fire department has six paid personnel who are 9-1-1 dispatchers/firefighter-engineers. The professional fire department operates dispatch services for all law enforcement, fire, and emergency medical service agencies within Lake County (an 8,000-square-mile area). The volunteer fire department is comprised of approximately 23 volunteers. The rural fire department is comprised of all the professional and volunteer personnel (Firehouse Network, 2009). Fire prevention services would be available on site at the Lakeview facility for small emergencies and would follow the protocols of the revised Ruby Fire Prevention and Suppression Plan (see Appendix H).

The Lakeview Police Department works in cooperation with the Oregon State Police, Lake County Sheriff's Office, Modoc County (California) Sheriff's Office, and the California Highway Patrol to ensure the security and safety of the Town of Lakeview (Town of Lakeview, 2009). Appendix P provides additional information regarding law enforcement personnel in the vicinity of the Town of Lakeview.

Ruby does not anticipate that a significant percentage of family members would accompany construction workers during the project, and no school-age children would be allowed to lodge at the Lakeview Temporary Housing Facility. Thus, we conclude there would be no project-related impact on area schools.

There would be no long-term impacts on public services because only 19 permanent employees would be associated with the project, 11 of which would likely reside in Colorado. Construction of the Ruby Pipeline Project would not significantly affect public services in affected counties or communities due to the short duration of construction and the large area over which the workforce would be dispersed. The counties, cities, and towns in the project vicinity presently have and would continue to have adequate infrastructure and services to meet the needs of the non-local workers.

4.9.4 Transportation

Construction activities could result in short-term impacts on transportation infrastructure. These impacts could include disruption to traffic flow due to the movement of construction equipment, materials, and crew members; construction of pipeline facilities across existing roads and railways; and

damage to local roads from the movement of heavy construction equipment and materials. Ruby has prepared a Traffic and Transportation Management Plan (Appendix X), which is discussed further below.

Construction across paved roads, unpaved roads where traffic cannot be interrupted, and railroads would result in short-term impacts on public transportation while construction activities pass through the project area. Such crossings would generally be completed by boring under the feature. There would be little or no disruption of traffic at road or railroad crossings by use of this technique.

Most smaller, unpaved roads and driveways would be crossed using the open-cut method. For public roads, the open-cut method generally requires a temporary road closure and establishment of detours. If no reasonable detour is feasible, at least one lane of the road being crossed would be kept open to traffic except for brief periods when it would be essential to close the road to install the pipeline. Most open-cut crossings require only 1 or 2 days to install the pipe and backfill the trench, although final road resurfacing could require several weeks to allow for soil settlement and compaction. Ruby would work with individual landowners to determine the best way to cross privately owned roads.

Construction of the pipeline would require a peak construction workforce of 3,500 persons, or 500 persons per spread. Construction of the compressor stations would require a peak construction workforce of 800 persons, or 200 persons per station. Ruby anticipates that about 200 vehicles would be mobilized to support construction on each spread and at each station. These vehicles include personal transportation for an estimated 100 equipment operators, 30 welders, 15 foremen, 25 miscellaneous workers, and 30 inspectors for each spread. Many of the workers would depart directly from their homes or lodging each day and drive directly to the construction right-of-way. However, some workers would report to a contractor yard before boarding a bus and being transported to the right-of-way. Ruby estimates it would use 8 to 10 buses for transporting construction workers from the contractor yards to the construction right-of-way.

Vehicles would also be entering and leaving the contractor yard throughout the day to accommodate construction management personnel, supply trucks, and vendors. Stringing trucks would deliver pipe to the right-of-way from pipe storage and staging areas. Each yard would accommodate approximately 50 stringing truck trips to the right-of-way each day. Heavy construction equipment would generally travel along established roads 6 to 7 days per week during daylight hours, with primary movements occurring between 5:00 and 6:00 in the morning and at 6:00 in the evening. Road bores, HDDs, and hydrostatic testing work would be conducted 24 hours per day and may require support traffic until the activity is completed.

Paved roads could see an increase in sediment tracking from equipment and vehicle traffic. Roads also could experience surface damage. Every axle passing over a road consumes a portion of the pavement's life. With each application of load, the pavement experiences compression and bending that eventually lead to rutting and cracking. Road tests have shown that the amount of pavement life consumed by heavy axles greatly exceeds the amount of life consumed by light axles. Paved roads are the most durable and stand up well to periodic surges in traffic and heavy use. Unpaved roads, on the other hand, are much less durable. Most states have adopted rules and procedures that help the trucking industry to operate competitively, have developed permitting systems that allow truckers to obtain permits quickly, and have identified safe routes for movement of oversize and overweight vehicles. Most states fund road repairs with motor fuel taxes, motor vehicle registration fees, and compensatory fees paid by commercial carriers. Commercial carriers need registrations to operate in each state and may need special permits for oversize and overweight vehicles, temporary trip permits within the state, or to haul hazardous materials. Ruby would coordinate with state and local departments of transportation and land managing agencies to obtain the required permits to operate trucks on public roads. Ruby also has stated it would inspect roads periodically during the construction period and would repair the roads as needed. Following

construction, public roads would be repaired as close as practicable to their original condition, while private roads would be returned to their original condition or better unless otherwise requested by the landowner or land managing agency.

Ruby's Traffic and Transportation Plan (Appendix X) includes an analysis of the existing road network in the project area. This analysis concludes that all state-maintained roads are well under capacity, and with the addition of the proposed construction traffic the roads would be under 50 percent capacity at peak hour and most would be under 25 percent capacity at peak hour. We have reviewed this analysis and generally agree with its conclusions; however, we also note that a previous version of Ruby's Traffic and Transportation Plan committed Ruby to working with local governmental agencies to define specific traffic control procedures where traffic could be disrupted by construction or construction-related traffic. Ruby's current version of its Traffic and Transportation Plan does not include this commitment. Therefore, **we recommend that Ruby work with local governmental agencies in Elko, Winnemucca, in the area of the Vya Construction Camp, and where conflicts with mining traffic may occur to identify all areas where traffic could be disrupted by construction or construction-related traffic and define specific traffic control plans for each of these locations. These plans should include (at a minimum) a commitment to provide, as necessary:**

- **a. signage to identify approaching construction or access points;**
- **b. daily review and cleanup of sediment deposits and pavement damage on roadways; and**
- **c. traffic control personnel in areas of lane closures or heavy traffic.**

The traffic control plans should be filed for review and written approval of the Director of OEP prior to construction.

Although the roads in the project area are generally rural with a low volume of traffic, there are several large mining operations in northern Nevada. The roads leading to these mines can be congested at peak morning and evening hours. The mines in the proximity of the project area are clustered in two areas in Nevada: the Carlin and Getchell trends. The Carlin Trend is located west of the city of Elko and the Getchell Trend is located east of the city of Winnemucca (USGS, 2007). We have reviewed the analysis in Ruby's Traffic and Transportation Plan regarding current traffic levels in these areas due to mining activities, and Ruby's proposed measures to minimize impacts on these mining communities. Commuting patterns could create temporary traffic congestion if peak travel hours for the mining community and the project coincide. This impact, however pronounced, would be short-lived based on the projected 10-month construction schedule.

We received a comment on the draft EIS regarding the possibility of Ruby utilizing the Goose Lake Railroad to transport pipeline equipment and supplies to the project area. Ruby is negotiating with the Lake County Commission to determine if Ruby could assist in improving the condition of the Goose Lake Railroad through a grant process called ConnectOregon II. ConnectOregon is administered by ODOT and is a lottery-bond-based initiative first approved by the 2005 Oregon Legislature to invest in air, rail, marine, and transit infrastructure (ODOT, 2009). Ruby has agreed to contribute a portion of the matching funds required by the ConnectOregon II grant to facilitate the improvement of the railroad and is awaiting acceptance by the Lake County Commission. If the Lake County Commission accepts Ruby's offer, Ruby would be granted approval to utilize the railroad for the transportation of pipeline equipment and supplies to the project area. This would lessen the impacts on the local transportation infrastructure. Further, the railroad improvements would benefit the local Lake County economy by creating long-term stimulus through the increased capability of the transportation network in Lake County.

We received several comments regarding potential traffic and transportation impacts associated with the Vya Construction Camp. The Vya camp is located at a crossroads of Washoe CR 34, which runs north-south, and Washoe CR 8A, which runs east-west. Both CR 34 and CR 8A are unpaved, gravel roads traversing active rangeland, and in some areas roads may be unfenced. To the west of Vya, at the California border, CR 8A becomes SR 299. SR 299 is a paved two-lane road that can be taken west to reach the community of Cedarville in Modoc County, California. If taken east from Vya, CR 8A crosses into the Sheldon NWR and connects to SR 140. CR 34 runs south from Vya to the community of Gerlach, Washoe County, Nevada. From Gerlach, Nevada SR 447 leads south to I-80 and Reno. SR 447 is a paved, two-lane road, and I-80 is a paved, four-lane road. The eastern Modoc County cities of Eagleville, Cedarville, Lake City, and Fort Bidwell are connected through the Surprise Valley Road, which runs from the southern county line north to the Oregon border.

In addition to housing construction workers, the Vya Construction Camp would serve as a contractor staging yard. Therefore, the Vya camp would produce the same amount of traffic as a contractor yard during the day. A typical construction camp can be divided into two general categories: workforce personal vehicles and supply trucks. Those workers that do not live at the Vya camp would drive their personal vehicles to the camp and their vehicles would remain parked at the camp until the end of spread construction, except for an occasional trip off site during non-working days. The construction workforce would primarily reach Vya from I-80 in Nevada by taking SR 447 north to CR 34 north to Vya. We anticipate this to be the case because the construction spreads run from east to west, so the workers who have been on the project would be coming primarily from the east, from Washoe and Humboldt counties, Nevada. There is a potential that some workers may come to Vya from California out of Cedarville or Alturas. In this case, SR 299 through Alturas would be used in combination with CRs 8A and 34. However, because only a low volume of workers are expected to use this route and they would primarily use it for one-time transportation to Vya or an occasional trip during non-working days, this additional traffic would not be disruptive to California SR 299.

Once the workforce is at Vya, 8 to 10 buses would be used to transport pipeline laborers from the camp to the pipeline right-of-way on a daily basis. The pipeline right-of-way is located east and north of the Vya camp location and would be accessed via an approximately 10-mile-long segment of CR 8A. In addition, specialty workers such as welders and inspectors would drive their personal trucks from the camp to the right-of-way using the same segment of CR 8A. These specialty workers would add 50 to 60 additional vehicles to CR 8A. Vehicle movements would generally occur during the daylight hours, with primary movements occurring between 5:00 and 6:00 in the morning and at about 6:00 in the evening. Most pipeline equipment supply trucks would reach Vya via CR 34. All supplies except pipe would come from Reno. Trucks transporting supplies from Reno to Vya would take I-80 east from Reno to West Fernley, then Nevada SR 447 north to Gerlach, then CR 34 north to Vya. Appendix W provides average daily traffic counts for SR 447. Data suggest that with the addition of 400 vehicles at peak hour, SR 447 would be at 12 percent of its capacity. We expect that off-hours traffic to nearby areas would be minimal due to planned work schedules. Some additional traffic related to the project may occur on SR 299 between Cedarville and Vya. Ruby estimates there would be 40 vehicular trips on SR 299 weekly.

As with all other project areas, Ruby would place signage to indicate heavy truck traffic at appropriate locations near Vya. Ruby is currently working with Modoc and Washoe county governments to determine appropriate speed limits and weight capacity for the roads. Potential impacts on local traffic patterns in the area would vary depending on the number of workers at the camp, timing, and construction activity. These impacts would be temporary and would be conducted within the bounds of local permits and guidelines and as permitted by local landowners.

In addition, increased vehicle traffic from construction activity around the Vya Construction Camp could cause traffic congestion and inconveniences for festival participants traveling to and from the

Burning Man Festival (see section 4.8.3.6). While the project is sufficiently far enough away from the festival as to not cause a direct impact, the presence of construction traffic associated with the Vya camp could disturb access for those traveling to the festival on CR 34. To reduce these impacts, Ruby has committed to work with Washoe County to mitigate traffic impacts by not scheduling any major shift changes in personnel during times when the majority of people are entering or leaving the festival. Ruby would employ traffic monitors during the festival to ensure that construction traffic does not disturb access of festival attendees, and Ruby would place signs on CRs 34 and 8A to alert drivers to the presence of construction-related traffic.

Roadways surrounding the Vya Construction Camp typically have limited use and would experience intensive use during the construction period, which might result in surface impacts on gravel and dirt roads. Ruby is currently working with the Washoe and Humboldt county road divisions to identify needed improvements in local roads prior to establishing the Vya camp and starting construction. In addition, addressing maintenance issues as they arise rather than waiting until the end of the project would prevent small issues from developing into more extensive road damage. Under the current construction schedule, little snowfall is expected in area of the camp during the construction period. Climatological data shows that the area averages of about 2.9 inches of snowfall in November and about 2.3 inches of snowfall in December (WRCC, 2009). If snow removal is required, Ruby's contractor would utilize road graders to maintain the road and remove snow as approved by the county. Following construction, the roads would be restored as close as practicable to their original condition or better. Ruby's Traffic and Transportation Management Plan (Appendix X) also discusses potential mitigation to roads that may be affected by construction.

During the construction period, Ruby would inspect roads periodically and repair them, as needed, at its own expense. Depending on the quality of the road surface, impacts could occur to gravel or dirt roads during camp operation.

Ingress and egress from the Lakeview Temporary Housing Facility would be via a graveled road off of Roberta Avenue at the northeastern corner of the site and a paved road off of Roberta Avenue entering the center of the site (see site layout provided in Appendix P). The paved road would extend through the center of the Lakeview facility, with gravel roads providing access to the modular housing units. Parking would be provided off the graveled roads and adjacent to the modular housing units.

Ruby anticipates that some of the workers would carpool to the housing facility at the beginning of the project, but most would drive their own personal vehicles. Sufficient on-site parking would be provided for construction worker vehicles. During the construction period, Ruby estimates that approximately 130 vehicles would leave and return to the housing facility each day. The workers would carpool from the Lakeview facility to the contractor yard in Lakeview, where they would then either bus or carpool from the yard to the project work site. All ingress and egress from the site would be onto Roberta Avenue, with the majority of vehicles turning left onto Roberta Avenue and traveling north to intersect with SR 140, then turning right to the contractor yard and the City of Lakeview. Some vehicles, primarily technical specialists in their individual vehicles, would turn right onto Roberta Avenue, left onto 3rd Street, and travel east until they intersect with SR 140, heading south directly to the project site. During the morning, the vehicles would leave the housing facility between the hours of 5:00 a.m. and 7:00 a.m.

Traffic counts on SR 140 (0.1 mile east of Roberta Avenue) indicate an average annual daily traffic count of 2,200 vehicles (ODOT, 2009). Depending on the flow of traffic from the housing facility and the volume of traffic on SR 140, there is a potential for traffic congestion at the intersection of SR 140 and Roberta Avenue, primarily on Roberta Avenue while vehicles wait to make right hand turns onto SR 140. During the evening hours, it is expected that workers would return to the housing facility over an

extended period of time, primarily between the hours of 5:00 p.m. and 9:00 p.m. Traffic congestion is not expected during the evening hours of workers returning to the housing facility. Ruby would meet with the ODOT to determine what, if any, mitigation would be required at the intersection of Roberta Avenue and SR 140 during the morning work commute.

4.9.5 Property Values

We received comments during scoping regarding the potential for property devaluation resulting from construction damage or placement of a permanent pipeline easement. An easement would be used to convey both temporary (construction-related) and permanent rights-of-way to Ruby. The easement would give Ruby the right to construct, operate, and maintain the pipeline, and would establish a permanent right-of-way. In return, Ruby would compensate the landowner for use of the land. The easement agreement between Ruby and the landowner would specify compensation for damage to property during construction, loss of use during construction, loss of renewable and nonrenewable or other resources, and allowable uses of the permanent right-of-way after construction. If an easement could not be negotiated with the landowner and the project is granted a Certificate, the easement could be obtained by use of eminent domain. In this case, the property owner would still be compensated by Ruby but the amount of compensation would be determined by the courts.

The effect that a pipeline easement may have to property values is a damage-related issue that would be negotiated between the parties during the easement acquisition process. The easement acquisition process is designed to provide fair compensation to the landowner for the right to use the property for pipeline construction and operation. Appraisal methods used to value land would be based on objective characteristics of the property and any improvements. The impact a pipeline could have on the value of a tract of land would depend on many factors including the size of the tract, the values of adjacent properties, the presence of other utilities, the current value of the land, and the current land use. Subjective valuation is generally not considered in appraisals. This is not to say that the pipeline would not affect resale values. A potential purchaser of property may make a decision to purchase land based on his or her planned use. An industrial user might find the pipeline (*i.e.*, a potential source of energy for an industrial plant) preferable; a farmer or resident may or may not find it objectionable. If the presence of a pipeline renders the planned use infeasible, it is possible that a potential purchaser would decide not to purchase the property. However, each potential purchaser has different criteria and differing capabilities to purchase land.

Property taxes for a piece of property are generally based on the actual use of the land. Construction of the pipeline would not change the general use of the land but would preclude construction of aboveground structures on the permanent right-of-way. If a landowner feels that the presence of a pipeline easement reduces the value of his or her land, resulting in an overpayment of property taxes, he or she could appeal the issue of the assessment and subsequent property taxation to the local property tax agency.

4.9.6 Economy and Tax Revenues

Ruby estimated the capital cost for the project would be about $3.0 billion. Direct payroll and materials expenditures related to the project would have an immediate impact on local economies. Workers would spend a portion of their pay in local communities on items such as housing, food, automobile expenses, entertainment, and other items. Ruby would purchase goods and materials locally when possible which would stimulate local businesses. Sales tax would be generated on items purchased in the project area. These direct impacts would stimulate indirect impacts within the region as inventories are restocked and new workers are hired to meet demands.

Ruby has estimated that the total project construction payroll would be $523 million. Payroll taxes would be collected from the workers employed on the project. Approximately $78.5 million of the total payroll would be received by local workers (assuming that 15 percent of the workforce would be hired locally). This would translate to a disposable income of approximately $69 million for the entire project. Ruby has estimated that about $20 million in consumables and project-specific materials such as fuel, tires, concrete, sand, gravel, and office supplies would be purchased locally.

At our request, Ruby conducted a basic regional input-output multiplier analysis for the Ruby Pipeline Project to estimate overall economic impacts of constructing and operating the pipeline. The analysis accounted for the direct increase in demand for goods and services that would result from the project, as well as the indirect and induced demand for goods and services. Indirect effects are changes in backward-linked industries due to the new demand of the directly affected industry. For example, demand for $1 million worth of pipe from the pipe industry would require the iron mining industry to increase its output as well. Induced effects take this linkage a step further and measures the changes of all industries' output as a result of changes in household consumption generated from the increased household income stemming from the direct and indirect effects of business activity. These types of indirect and induced effects are often likened to a ripple through water.

Economists have come up with a model for estimating the ripple effect of changes in the economy. This model is complex and relies on multipliers, which are numerical coefficients that relate a change in demand in one industry to consequential changes in total output, wages, and employment in other industries. The output multipliers represent the total dollar change in output (total expenditures) that occurs for each additional dollar of output (direct expenditures). For example, an output multiplier of 1.50 for hotels and lodging places means that for each $1.00 spent for lodging, an additional $0.50 is spent by the lodging establishment and supporting industries (wages, goods and services, capital improvements). The $1.00 is the direct expenditure, the $0.50 is the indirect and induced expenditure and $1.50 is the total economic impact.

Ruby used data provided by Minnesota IMPLAN Group, Inc. to identify multipliers for the project area and to calculate the economic impact of construction and operation of the Ruby Pipeline Project. Based on its analysis, Ruby identified a 1.41 multiplier for the project area. This means that for every $1.00 Ruby would spend in project area, an additional $0.41 of indirect and induced output would be expected. Ruby estimates it would spend about $89 million locally for payroll and construction supplies. Therefore, an additional $36.5 million of indirect and induced output would be expected. Table 4.9.6-1 provides a breakdown of economic impacts by state based on construction phase estimates of resources that would be directly mobilized in these states and the unique economic structure of supporting industry sectors within each state. Overall, these indirect and induced economic impacts would represent a small fraction of the total output of each affected state and would represent a minor one-time, non-recurring stimulus to the statewide economies. Operational payroll would be relatively insignificant as only 19 employees would be employed permanently by the project, 11 of whom would most likely reside in Colorado.

Construction and operation of the project would have beneficial impacts on local sales tax revenue in Nevada, Utah, and Wyoming (Oregon does not have a state sales tax). The anticipated revenue from sales tax across the project would be about $73.9 million. Sales tax generated during operational activities would be relatively insignificant as only 19 employees would be employed permanently by the project, 11 of whom would most likely reside in Colorado.

TABLE 4.9.6-1

Total Estimated Economic Output for the Ruby Pipeline Project (in millions)

State	Local Payroll (1)	Construction Supplies (2)	Direct Expenditures (3)=(1)+(2)	Indirect Impacts (4)	Induced Impacts (5)	Total Output (6)=(3+4+5)
Wyoming	$5.0	$1.5	$6.5	$1.2	$0.8	$8.4
Utah	$8.3	$2.4	$10.7	$2.9	$2.4	$16.0
Nevada	$37.0	$10.7	$47.7	$8.4	$7.5	$63.6
Oregon	$18.7	$5.4	$24.1	$7.4	$5.9	$37.4
Total	**$69.0**	**$20.0**	**$89.0**	**$19.8**	**$16.7**	**$125.4**

The most significant tax impacts would be generated by *ad valorem* taxes. *Ad valorem* taxes are property taxes that would be assessed per year and distributed to the affected counties according to the proportion of miles of the project within each jurisdiction during the pipeline's operational period, which is estimated to be 50 years. The total estimated *ad valorem* tax would be about $28.7 million per year. Table 4.9.6-2 provides an estimated *ad valorem* tax allocation by state and county.

TABLE 4.9.6-2

Estimated Annual Property (Ad Valorem) Tax for the Ruby Pipeline Project

State/County	Estimated Tax[a]
WYOMING	$2,110,242
Lincoln	$1,317,125
Uinta	$793,116
UTAH	$7,818,176
Rich	$598,813
Cache	$1,567,010
Box Elder	$5,652,354
NEVADA	$15,581,964
Elko	$7,403,280
Humboldt	$5,518,523
Washoe	$2,660,161
OREGON	$3,154,210
Lake	$1,854,911
Klamath	$1,299,298
Total	**$28,664,591**

a Totals may not add due to rounding.

The Ruby Pipeline Project would benefit the state and local economies by creating a short-term stimulus to the affected areas through payroll expenditures, local purchases of consumables and project-specific materials, and sales tax. Operational impacts of these benefits would not be as significant.

However, operation of the project would result in long-term property tax benefits for counties affected by the project.

The Lincoln County (Wyoming) Board of Commissioners commented that the large amount of compensatory mitigation proposed by Ruby may have a negative economic impact because it would involve purchasing private land and placing it in public ownership (see Appendix M). The Lincoln County Board of Commissioners is concerned that such a land acquisition would remove property from the local tax base and could involve land that is an important part of the local community and economy. However, Ruby is not proposing to purchase property for this purpose in Wyoming. Ruby is proposing to possibly fund the purchase of at least two adjacent parcels of property in Cache County, Utah. Ruby would provide funding so that the land could be placed under a conservation easement with a non-profit land trust for management and protection of the property in perpetuity. In Utah, land subject to a conservation easement is assessed property tax at fair market value, although the county assessor is required to include as part of the assessment any effects the conservation easement may have on the fair market value of the property. The federal government may allow a tax deduction if the easement is perpetual and donated exclusively for conservation purposes. The amount of the tax deduction would be determined by the value of the conservation easement. Such land acquisitions could have negative tax impacts on local communities and could remove economically valuable land from production.

We received a comment regarding the potential economic impacts of grazing deferment. The commenter noted that grazing deferment agreements could stretch beyond 2 or 3 years to allow reclamation to meet the identified goals as discussed in section 4.8.1.1. The commenter indicated this could positively affect the economy if the additional deferment payments exceed fluctuating cattle prices, or could negatively affect the economy if the deferment payments are less than cattle prices. As discussed in section 4.9.5, property value is a damage-related issue that would be negotiated between Ruby and the landowner and/or permittee during the easement acquisition process.

We received comments on the draft EIS inquiring about what goods and services would be purchased locally for the Vya Construction Camp. Ruby and the construction contractor are in the process of contracting with local business owners in Cedarville and Alturas, California, for shipments of food (the camp would prepare/provide workers with breakfast, dinner, and a bag lunch), fuel, and ice, along with their local deliveries. This temporary spending would stimulate the local economy in the counties of Modoc, California and Washoe, Nevada. In addition, the businesses that would most likely receive any additional construction phase discretionary spending would be located within the food service sectors, retail trade, arts, entertainment and recreation, and possibly accommodations. These outlets (numbering at least 53 establishments) would provide recreational and retail spending opportunities for the construction workers living at the Vya camp (see Appendix P for additional information). However, due to the demanding schedules for workers on this project (6 to 7 days per week, 10 to 12 hours per day), the distance of the camp from these towns, the short duration of the construction period, and the services provided at the camp, it is unlikely that significant numbers of employees living at the camp would utilize these services.

At the Lakeview Temporary Housing Facility, the businesses that would most likely receive the bulk of construction phase discretionary spending would be located within the retail trade; arts and entertainment; and accommodations and food services sectors. These outlets (numbering at least 70 establishments) would provide recreational and retail spending opportunity for the construction workers living at the housing facility (see Appendix P for additional information). It is likely that many workers would avail themselves of discretionary spending opportunities at these outlets, thereby creating a short-term stimulus to the Town of Lakeview and Lake County through the purchase of goods and services. In addition, Ruby would likely purchase basic supplies for the Lakeview facility as they need replenishment. The Town of Lakeview commented on the draft EIS that it is in support of the project and is cooperating

with Ruby to establish the Lakeview facility; and that the Lakeview facility would provide a much-needed boost to their local economy.

4.9.7 Environmental Justice

Executive Order 12898 on Environmental Justice requires that each federal agency address disproportionate human health and environmental impacts that a community may experience because of its social, economic, or political position. Environmental effects of the project on minority and low-income communities or Native American programs must be disclosed. Environmental Justice issues can potentially arise when minority, low-income, or Native American communities are disproportionately impacted by an activity related to a proposed project.

Overall, the Ruby project area has a lower average minority population rate (6 percent) than the national average (24 percent). The project area has a lower average poverty rate in Wyoming, Utah, and Nevada (10 percent) than the national average (13 percent). The project area in Oregon, however, has a higher poverty rate (16 percent) than the national average. Table 4.9.7-1 provides the general ethnic composition of the states and counties that would be affected by the project. Table 4.9.7-2 provides the general economic status of these states and counties.

TABLE 4.9.7-1

Racial/Ethnic Comparison for Counties Crossed by the Ruby Pipeline Project (in percent)[a]

State/County	White	Black	Native American & Alaskan Native	Asian	Native Hawaiian & Pacific Islander	Persons Reporting Two or More Races	Persons of Hispanic or Latino Origin[b]
WYOMING							
Lincoln	97.7	0.2	0.7	0.3	0.1	1.1	3.6
Uinta	96.9	0.2	1.1	0.4	0.1	1.3	7.2
UTAH							
Rich	99.2	-	0.1	0.3	-	0.3	2.4
Cache	95.1	0.7	0.6	2.3	0.2	1.0	8.6
Box Elder	96.5	0.3	1.0	1.1	0.1	1.1	7.2
NEVADA							
Elko	91.2	1.1	5.3	0.9	0.2	1.3	21.7
Humboldt	91.8	0.7	4.9	0.8	0.1	1.7	21.4
Washoe	87.9	2.5	1.9	4.9	0.5	2.2	20.7
OREGON							
Lake	94.0	0.2	2.6	0.8	0.2	2.3	7.2
Klamath	91.3	0.8	4.0	1.0	0.2	2.7	8.9

a U.S. Census Bureau, 2007.

b People who identify themselves as Hispanic or Latino may be of any race and are also included in other race categories.

TABLE 4.9.7-2

Economic Statistics for Counties Crossed by the Ruby Pipeline Project

State/County	Median Household Income (2007)[a]	Persons Below Poverty (2007)[a] (percent)	Households Receiving Public Assistance (2000)[b] (percent)
WYOMING			
Lincoln	$54,731	7.9	1.9
Uinta	$57,858	9.8	4.2
UTAH			
Rich	$49,889	9.0	4.6
Cache	$46,883	12.9	4.3
Box Elder	$52,615	8.3	4.8
NEVADA			
Elko	$62,801	8.7	3.7
Humboldt	$56,875	11.4	3.9
Washoe	$54,524	10.2	4.2
OREGON			
Lake	$37,129	15.6	6.8
Klamath	$41,724	15.9	8.0

a U.S. Census Bureau, 2007.
b U.S. Census Bureau, 2000b.

To assess the composition of the communities in proximity to the pipeline, census tract, county, and state median household income and poverty indicators and percentages of minority and Hispanic households were reviewed for areas within a 2-mile buffer zone of the pipeline corridor. In addition, the nearby Native American tribal lands were reviewed to determine the presence of potential communities that would have Environmental Justice issues. The minority ratio aggregation was defined to include individuals who were members of the following single race population groups: American Indian or Alaskan Native; Asian or Pacific Islander; and Black, not of Hispanic origin. The Hispanic proportion of the population was reported separately and is also considered a minority population. Guidance from the CEQ states that "minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis" (CEQ, 1997).

Ruby evaluated several routes before selecting its proposed route (see section 3.4). According to Ruby, major factors considered in selecting its proposed route included constructability of terrain, existing congestion and development, availability of supporting infrastructure, opportunities for collocation, current land uses, sensitive environmental resources, overall cost, and agency input. Our review of Ruby's proposed route identified three census tracts of disproportionally high minority populations or persons living below the poverty threshold and two areas of comparatively high Native American populations. Data identified one area (census tract 9515) located in Elko County, Nevada, with a majority Hispanic population of 52 percent. This tract also contains a higher percentage of families living below the poverty threshold compared to the county total (15.6 percent *versus* 7 percent). Another area (census tract 9506), also within Elko County, has an Hispanic minority of 37.6 percent of the total population. Within Klamath County, Oregon, there is a census tract (9706) that has a population composed of 32.7 percent Hispanic residents. This population is meaningfully greater than the Klamath County Hispanic proportion of 8 percent. The composition analysis within the 2-mile buffer zone identified one area in Washoe County, Nevada (census tract 35.01) between MP 540 and 590, the Native American population proportion is the largest compared to general population ratios for both the county and the state (14.1 percent). In addition, a Native American population was identified from MP 440 to

MP 540 in Humboldt County, Nevada, of approximately 7.1 percent. Portions of this area along the pipeline route have been identified by the Summit Lake Paiute Tribe as traditional hunting and gathering areas.

We received a comment on the draft EIS questioning the use of census data for ethnic comparison in the project area. The commenter noted that these types of data omit any reference to the cultural significance of traditional tribal economy and other traditional activities that would be impacted. The commenter notes that Native American tribes should be considered as a distinct and separate population with interests and legal entitlements different from those of other ethnic groups. We acknowledge that tribal economies may rely more heavily on traditional resources and practices. We also note that Ruby has engaged in outreach to Native American tribes regarding cultural resource issues and other project concerns, such as impacts on wildlife and subsistence lifestyles. Ruby has retained a Native American Coordinator who is assisting in identifying and training local Native American tribal monitors along the pipeline route to ensure that potential cultural impacts of the project, including any potential impacts on subsistence practices, are properly recognized and respected.

Communities within the vicinity of the Vya Construction Camp also were evaluated to determine whether the presence of the camp and related activities would disproportionately impact any minority or low income populations residing within the camp's vicinity. The area evaluated corresponds to zip code areas within the Surprise Valley. Census data regarding racial composition and poverty status were evaluated for zip code areas that correspond to the main population centers (towns) within the Surprise Valley. Table 4.9.7-3 presents the Environmental Justice Population composition indicators and shows that with the exception of the Fort Bidwell area, minority communities are not concentrated in any significant numbers near the proposed camp (Surprise Valley) vicinity.

TABLE 4.9.7-3

Racial/Ethnic Comparison for Communities in Surprise Valley and the Vicinity of the Vya Construction Camp (in percent)[a]

State/County/ Community[b]	Total Population	White (%)	Black (%)	Native American & Alaskan Native (%)	Asian (%)	Native Hawaiian & Pacific Islander (%)	Persons Reporting Two or More Races (%)	Persons of Hispanic or Latino Origin (%)[c]
CALIFORNIA	36,264,467	60.4	6.3	0.7	12.2	0.4	3.3	35.7
Modoc	9,449	85.9	0.7	4.2	0.6	0.1	2.8	11.5
Cedarville	849	90.3	0.1	3.8	0.7	0.0	2.0	8.5
Lake City	122	93.4	0.0	4.9	0.0	0.0	1.6	0.8
Fort Bidwell	214	50.0	0.0	48.1	0.0	0.0	1.4	7.9
Eagleville	116	91.4	0.0	1.7	0.0	0.0	0.0	6.9
NEVADA	2,488,917	74.6	7.3	1.2	5.9	0.5	3.1	24.3
Washoe	398,348	78.7	2.2	1.8	4.8	0.4	2.6	20.2

a U.S. Census Bureau, 2009.

b Composition data for Modoc County and the communities within Modoc County were obtained from Census 2000; State of California, State of Nevada, and Washoe County data were obtained from 2007 American Community Survey.

c People who identify themselves as Hispanic or Latino may be of any race and are also included in other race categories.

The composition analysis within the Surprise Valley area has identified the Fort Bidwell Indian Community as one community that could potentially be impacted. The Native American population proportion is the largest compared to the general population ratios for the Fort Bidwell zip code area (48.1 percent versus 4 percent for Modoc County). The Fort Bidwell Indian Community is a federal reservation of Paiute Indians (part of the Northern Paiute Community, which also includes the Summit Lake Paiute

Tribe) in Modoc County located within the far northwestern corner of California, near the town of Fort Bidwell. The reservation is 3,335 acres in size and has a population of approximately 108 individuals (ITMA, 2009).

The Fort Bidwell Indian Community (as well as the Summit Lake Paiute Tribe) have voiced concerns about the location of the construction camp and potential impacts on wildlife, traditional foods, and potential interference/encroachment on burial grounds and sacred areas used for traditional and religious purposes (*i.e.*, hunting, gathering, and spiritual purposes). Specifically, the Fort Bidwell Indian Community has expressed concern that the project could potentially damage its ancestral homeland including sacred sites and burial sites, and also expressed disappointment in the government-to-government consultation efforts. We note that Ruby has engaged in significant outreach to Native American tribes regarding cultural resource issues and other project concerns, such as impacts on wildlife and subsistence lifestyles. As with other project areas, Ruby has retained a Native American Coordinator who is assisting in identifying and training local Native American tribal monitors along the pipeline route to ensure that potential cultural impacts of the project, including any potential impacts on subsistence practices, are properly recognized and respected.

The FERC and BLM have implemented a public review and comment process for the involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. This process is described in section 1.3. During the public review and comment process, Native American populations expressed concern about the potential for the proposed pipeline to impact traditional Northern Paiute foods, medicines, and other current or historic subsistence resources. They also expressed concerns about known traditional sacred sites and possible burials in the project area. These concerns, including measures the FERC, BLM, and Ruby would take to address the concerns, are discussed in section 4.10. Based on the few areas of environmental justice target populations affected by the project, the factors considered in selecting the proposed route, the public review and comment process, and the measures being taken to address Native American concerns, we do not believe the Ruby Pipeline Project would concentrate an inequitable environmental burden on any minority or low-income communities or Native American programs.

4.9.8 Non-Jurisdictional Electric Power Lines

The Rocky Mountain Power and Harney Electric Cooperative electric transmission and distribution line routes occur in the same economic impact area as the Ruby Pipeline Project. Rocky Mountain Power is proposing to employ 12 workers to construct its facilities in Lincoln County, Wyoming over the course of two to three months. Harney Electric Cooperative is proposing to employ 6 to 10 workers in Humboldt County, Nevada over a two week period. Construction and operation of the lines would result in socioeconomic and environmental justice impacts similar in nature to the Ruby Pipeline Project, except on a smaller scale. Socioeconomic impacts due to the proposed work generally would be temporary and minor.

4.10 CULTURAL RESOURCES

The FERC, as the lead federal agency, and the BLM, FWS, USFS, COE, and Reclamation are responsible for complying with Section 106 of the NHPA, as amended, which requires federal agencies to take into account the effect of their undertakings (including the issuance of permits and certificates) on properties listed, or eligible for listing, on the NRHP and to afford the ACHP an opportunity to comment on the undertaking. In addition to these responsibilities, federal land managing agencies must consider

Native American religious and cultural concerns for the portions of the project crossing federal lands in accordance with the Archaeological Resources Protection Act, the Native American Graves Protection and Repatriation Act, and Sacred Sites Executive Order 13007. Federal agencies also must consider the effects of the project on properties of traditional religious and cultural importance to Native Americans in accordance with Section 101(d) (6) of the NHPA and the American Indian Religious Freedom Act. Ruby, as a non-federal party, and its contractor EPG, are assisting us to meet our obligations under Section 106 and the implementing regulations in 36 CFR 800 by preparing the necessary information, analyses, and recommendations, as authorized by 36 CFR 800.2(a)(3). In a letter dated May 19, 2009, the ACHP advised the FERC that, in response to concerns by Indian tribes, the ACHP would participate in the Section 106 consultation process for the Ruby Pipeline Project.

Construction and operation of the proposed project could potentially affect historic properties (*i.e.*, cultural resources listed or eligible for listing on the NRHP). These historic properties could include prehistoric or historic archaeological sites, districts, buildings, structures, and objects, as well as locations with traditional value to Native Americans or other groups, known as Traditional Cultural Properties (TCPs) (Parker and King, 1990). Such historic properties generally must possess integrity of location, design, setting, materials, workmanship, feeling, and association, and must meet one or more of the criteria specified in 36 CFR 60.4.

If an historic property would be adversely affected by the project we would resolve adverse effects pursuant to 36 CFR 800.6 of the Section 106 implementing regulations. This may involve mitigation, which may include, but would not be limited to, one or more of the following measures: 1) avoidance through realignment of the pipeline route, relocation of temporary extra workspaces, HDD, boring, or changes in the construction and/or operational design; 2) data recovery, which may include the systematic professional excavation of an archaeological site, or the preparation of photographs and/or measured drawings documenting standing structures or other historic features; and 3) the use of landscaping or other techniques that would minimize or eliminate effects to the historic setting or ambience of standing structures or other resources.

4.10.1 Cultural Resource Surveys

Ruby conducted cultural resource literature reviews and pedestrian surveys for the proposed 675.2-mile pipeline route. Ruby also surveyed temporary extra workspaces, access roads, the Vya Construction Camp, the Lakeview Temporary Housing Facility, and aboveground facility sites. Generally, a 300-foot-wide corridor was surveyed for the pipeline and a 100-foot-wide corridor was surveyed for access roads; these corridor widths were selected to encompass the maximum variable width of the project area of potential effect. Ruby has reported that field surveys for the proposed route are almost complete. The pipeline route through the Barrel Springs area in Nevada is still being inventoried and the survey report is pending. The FERC has received draft reports for most surveys and special studies, with the exception of the Barrel Springs area and areas not yet surveyed because of denied access. Ethnographic studies of Native American tribes who claim traditional territory along the pipeline route are nearing completion and final reports are expected in early 2010. Preliminary summary reports prepared by ethnographers have been provided by Ruby for the Klamath Tribes; Fort Bidwell Tribe; and the Shoshone and Paiute of the Duck Valley Indian Reservation and the Fort McDermitt Indian Reservation. Ruby also filed an internal ethnographic study prepared by the Summit Lake Paiute Tribe. Although an ethnographic study of the Reno-Sparks Indian Colony is underway, a preliminary report is not available at this time.

We received comments during the draft EIS comment period regarding the impact of the project on historic trails. A network of historic trails crosses the region where the pipeline would be located; these trails represent the period of rapid overland emigration to the West Coast. Ruby is coordinating

with public agencies such as the National Trails Intermountain Region Office of the National Park Service and private organizations such as the National California-Oregon Trail Center to identify trail locations and consider the project's impacts on historic trails. Any impacts on historic trails would be reported and evaluated during the Section 106 process. These trails are also addressed in sections 3.4.13 and 4.8.3.2.

We received several comments from Native Americans about the treatment of archaeological artifacts encountered during pedestrian field surveys. The commenters expressed the potential tribal connection to the artifacts and asked where the artifacts would be permanently curated. In response to tribal concerns and questions about the need for BLM to notify tribes before initiating collections, the tribes were told that policies for artifact collection were determined during pre-survey meetings between federal land managing agencies, SHPOs, and Ruby's contractors that conducted the surveys. Collection policies were designed according to the relevant standards and guidelines and to factors such as land ownership and the characteristics of the artifact. Generally, artifacts discovered on public land were collected if they were assignable to a particular date or past culture, or if they had the potential to provide additional information through studies such as obsidian hydration and source studies. Any permanent curation facilities would meet the standards set forth in 36 CFR 79.

4.10.1.1 Wyoming

Ruby conducted a literature review and pedestrian survey of 48 miles of the pipeline route in Wyoming. Ruby also surveyed 120.9 miles of access roads, approximately 30.8 acres for the Roberson Creek Compressor Station, approximately 78.2 acres for the Glencoe Junction pipe yard, 29.9 acres for the Sage Junction pipe yard, 32.2 acres for the Evanston construction yard, and 63.21 acres of staging access. Site types identified include prehistoric lithic scatters; historic artifact scatters; historic mines, ditches, and ranches; historic settlements (including the South Cumberland townsite); railroads; bridges; sites containing both prehistoric and historic components; and historic trails. The Oregon National Historic Trail would be crossed by the project. While the trail as a whole is eligible for the NRHP, Ruby has recommended that, due to more recent construction or erosion, the segments that would be crossed by the project are largely destroyed and are therefore non-contributing to its eligibility. Ruby submitted a draft report documenting the literature review and pedestrian survey to the FERC, BLM, and Wyoming SHPO. The BLM commented on the draft report and requested revisions and additional field studies.

Ruby conducted additional survey and site testing and provided a revised draft report in November 2009, which integrated the results of the previous survey. Additional areas surveyed included a pipe yard, a construction yard, staging areas, and access roads. A total of 100 sites were identified within the project area. Of the 100 sites, Ruby recommended 36 as eligible for the NRHP, and 64 as not eligible for the NRHP. Eighty-two of the sites were located within the project construction area, with 31 recommended as eligible and 51 recommended as not eligible. Avoidance, crossing at non-contributing portions, or various mitigation measures such as data recovery, monitoring, and open trench inspection were recommended for the eligible sites. The report also included an assessment of the visual impacts on historic properties in the Cumberland Gap Area in Wyoming. Seven properties were assessed including the Ziller Ranch, Sun Dial Rock Formation, Cumberland Mine, California/Oregon Trail, Company Ranch, and Cumberland Historic District. The assessment concluded that no effects to the landscape settings were anticipated because of existing cultural modifications (roads, pipelines, power lines, modern ranch facilities) which compromise the integrity of the landscape setting; topographical screening; and/or implementation of mitigation measures and revegetation of the right-of-way. This revised draft report is currently under review by the BLM and FERC.

4.10.1.2 Utah

Ruby conducted a literature review and pedestrian survey of about 195.5 miles of the pipeline route in Utah. Approximately 15.3 miles were not surveyed due to denied access. The survey identified a total of 75 archaeological sites within the survey corridor (33 eligible and 42 not eligible); 50 of these sites were located within the project construction area. Of the 50 sites, 23 were recommended as eligible for the NRHP and 27 were recommended as not eligible for the NRHP. Site types identified include prehistoric lithic and artifact scatters; a rockshelter; quarries; arborglyphs; historic artifact scatters; historic roads, canals, aqueducts, railroads, and telegraph/power lines; a homestead; and a historic pipeline. Of the 23 sites recommended as eligible, avoidance was recommended for 9 of the sites, mitigation was proposed for 12 of the sites (monitoring was also recommended for 3 of these sites), and 2 of the sites would be bored beneath. Ruby submitted a draft report documenting the literature review and pedestrian survey to the FERC, BLM, USFS, Utah SHPO, Utah Office of the Governor, Utah Department of Transportation, and SITLA in March 2009. UTPL and Utah Department of Transportation commented and requested additional information and revisions to the draft report. The FERC also provided comments on the draft report. A revised draft survey report was distributed in July 2009 and, following additional BLM comments, a finalized version distributed in November 2009.

In September 2009 Ruby submitted three draft addenda to the main survey report distributed in July 2009: 1) an assessment of the visual impacts on historic properties for Utah; 2) the geoarchaeological study of the project area in Utah; and 3) an addendum report for additional pedestrian surveys in Utah completed between October 2008 and August 2009, including approximately 60 miles of pipeline corridor (comprised of realignments and the previously denied access areas), 187.9 miles of access roads, and 646.7 acres of contractor yards, pipeyards, compressor stations, and staging areas. The visual assessment considered the landscape setting and views for the historic roads, canals, aqueducts, railroads, telegraph lines, homesteads, and the historic pipeline. The assessment concluded that minimal or no effects were anticipated due to modified landscape settings and/or implementation of mitigation measures, the geoarchaeological study concluded that subsurface excavation in moderate and high probability areas should be monitored. The addendum survey report identified an additional 48 sites including prehistoric lithic scatters; an arborglyph site; historic artifact scatters; historic roads, canals, aqueducts, homesteads, ranches, camps, and townsites; a railroad grade; a cement factory; and an historic pipeline. Twenty-three of the sites have been determined or were recommended as eligible for the NRHP. Twenty-five of the sites were determined or recommended as not eligible for the NRHP. Of the 23 eligible sites, avoidance was recommended for 2 sites; restrictions on use or maintenance of access roads was recommended for 5 sites; avoidance or mitigation was recommended for 8 sites; mitigation recommended for 4 sites; and 4 sites would be bored beneath. The report addenda are currently under review.

4.10.1.3 Nevada

Ruby conducted a literature review and pedestrian survey of about 357.4 miles of the pipeline route in Nevada. The survey identified a total of 549 archaeological sites within the survey corridor; 443 of these sites were located within the project construction area. An additional 39 sites were not evaluated for NRHP eligibility and would require further work. Of the 443 sites within the construction area, 218 sites were recommended as potentially eligible for the NRHP. Ruby proposed that there would be an adverse effect to these sites and recommended additional investigation/mitigation for these sites. Site types identified include lithic scatters (which constituted the majority of site types found), some containing groundstone; quarries; rockshelters; petroglyphs; historic trash scatters; historic roads, ditches, fencelines, polelines, and cairns; corrals; and an adit. Many of the prehistoric site types hold cultural significance for the Native American tribes that traditionally occupied the project area. The Summit Lake Paiute Tribe, Susanville Indian Rancheria, Fort Bidwell Tribe, Pyramid Lake Paiute Tribe, Reno-Sparks Indian Colony, and other tribes have expressed concern regarding impacts on these resources and

traditional places (see the discussion in section 4.10.3). Ruby submitted the draft report documenting the literature review and pedestrian survey to the FERC, BLM, and other project stakeholders. The FERC and BLM have commented on the draft report and requested additional information and revisions necessary for the BLM to make determinations of eligibility for BLM jurisdiction properties. The Reno-Sparks Indian Colony and the Summit Lake Paiute Tribe also submitted comments on the report. Ruby submitted a revised draft report in July 2009, and as a result of additional comments by the BLM, another revised draft in November 2009.

The most recent draft report reflects some project modifications and additional survey (such as realignments and reroutes) since the original filing. The report identifies a total of 570 (revised from the above 549 sites) sites within the survey corridor, with 253 recommended as eligible for the NRHP. Of these 253 sites, 229 are within the construction area for the project. Ruby has recommended that these sites would require treatment to mitigate potential adverse effects from construction. The Class I literature review contained in the survey report also identified two TCPs located along the pipeline centerline within the Winnemucca District of the BLM; the Paradise Valley TCP and Santa Rosa Mountains TCP. Ruby would identify the project impacts on these TCPs and propose mitigation measures. The revised draft report is currently under review by the agencies and other appropriate parties. SHPO review would commence following completion of agency review, and receipt of a letter of combined federal agency determinations from the FERC.

Ruby completed a supplemental survey of the Vya Construction Camp and also provided an Applegate-Lassen Trail visual impact assessment for the Vya camp. Ruby provided the visual assessment and survey report for the Vya camp on October 14, 2009. As a result of the Vya camp survey, ten archaeological sites, including historic refuse scatters, prehistoric lithic scatters, and a previously unrecorded segment of the Applegate-Lassen Trail were identified. The Applegate-Lassen Trail is one of the routes of the California Historic National Trail, which is listed on the NRHP; the segment identified was recommended as a contributing portion. Numerous mitigation measures were recommended for the trail including protective fencing, worker education, additional studies, and monitoring. None of the remaining nine sites were recommended as eligible for the NRHP. The visual assessment report concluded that minimal long-term residual effects are anticipated on the trail after the facilities are removed and restoration has been implemented. Ruby has indicated that it would return the site "as close as practical to its original condition, including pre-existing contours and vegetation, unless otherwise directed by the landowner." Therefore, there remains the potential for visual impacts on the Applegate-Lassen Trail. The Vya camp visual assessment and survey reports are currently under review.

Ruby also would prepare a plan for educating workers regarding the significance of protecting the trail. Each camp occupant would be required to review the plan and sign a document that details the use restrictions, including restrictions on using the historic trails and tribal lands, before they are assigned a resident location. More information about the Vya camp is provided in sections 4.8.3.2 and 4.9.

Ms. Wendi Lutz wrote several letters to the FERC that expressed her concerns about impacts resulting from construction and land use at the Vya Construction Camp, including potential impacts on the Applegate-Lassen Historic Trail. Ms. Lutz requested participation as a consulting party in the Section 106 process and this was granted by FERC.

In November 2009, Ruby submitted 4 draft addenda to the main survey report: 1) an addendum for survey of 97 access roads (totaling 149.33 miles); 2) a second addendum for survey of auxiliary facilities, including 2 compressor stations (Desert Valley and Wieland Flat), 20 main line valves, the Opal Valley Meter Station, 6 pipe storage yards, 56 staging areas, and 44 test manifolds; 3) a third addendum for survey of 6 reroutes (totaling 83.36 miles); and 4) the geoarchaeological study of the pipeline route in Nevada.

Ruby's survey of access roads resulted in the identification of 240 archaeological sites; 190 prehistoric sites (mostly lithic scatters), 21 historic sites (mostly refuse scatters), and 29 sites with both prehistoric and historic components. Of these, 78 were recommended as potentially eligible for the NRHP and 162 were recommended as not eligible for the NRHP. The report recommended avoidance or mitigation for the potentially eligible sites, and also provided a general recommendation for monitoring of ground-disturbing activities during construction.

The survey of auxiliary facilities identified 38 sites within the construction areas; 31 prehistoric sites (mostly lithic scatters), 1 historic site (a road and refuse scatter), and 6 sites with both prehistoric and historic components. Of these, 21 were recommended as potentially eligible for the NRHP and 10 were recommended as not eligible for the NRHP. The report recommended mitigation for the potentially eligible sites.

The survey of the reroutes identified 134 sites within the survey corridors; 95 prehistoric (mostly lithic scatters), 18 historic (mostly refuse scatters), and 21 sites with both prehistoric and historic components. Of these, 107 were identified within the project construction area, 49 of which were recommended as potentially eligible for the NRHP. The report recommended mitigation for the potentially eligible sites. The report also documented that 115 sites present on the original route were now avoided due to the reroutes.

The geoarchaeological study concluded that subsurface excavation in moderate and high probability areas should be monitored. The report is being reviewed by the FERC and BLM.

Ruby completed an assessment of the visual impacts on historic properties for Nevada; the report of this study has not yet been submitted.

Sections of the pipeline in the Barrel Springs area were re-inventoried in September of 2009 but a report has not yet been submitted. The BLM indicates that preliminary results of the reinventory identified approximately 694 rock stacks. The BLM also states that the preliminary findings, in addition to the data from the initial inventory, indicate that the Rock Creek Archaeological District boundaries should be expanded to the east, well beyond the proposed route within the Barrel Springs area.

On August 27, 2009, the BLM Surprise Field Office received a letter from the Fort Bidwell Indian Community Council identifying a potential TCP that includes portions of the proposed Ruby pipeline route. The potential TCP is located in Washoe County, Nevada on lands managed by the BLM. Ruby sponsored an ethnographic study of the Barrel Springs area with the Fort Bidwell Tribe, and provided a preliminary summary of the findings of this study, authored by Dr. Douglas Deur. The Fort Bidwell Reservation is located in northern California; the people of the community identify their aboriginal land as the northwestern corner of Nevada. Ruby's ethnographer conducted 13 formal interviews of members of the Fort Bidwell Paiute community, and 4 informal interviews in order to solicit information about traditional practices and places of importance. The ethnographic study of the Fort Bidwell Indian Community identified the Barrel Springs area in northwestern Nevada as a potential TCP, consisting of lands the Fort Bidwell Paiute community traditionally uses for hunting and gathering. The tribe has identified the following as primary species of concern within the potential TCP: groundhog (marmot), deer, pronghorn (antelope), jackrabbit, greater sage-grouse, trout, yampah, wild plum, chokecherry, and willow.

Archaeological features found within the potential TCP have been identified by tribal members as ritual areas associated with hunting and resource procurement. These archaeological sites and features appear to be visited by some Fort Bidwell tribal members for the purposes of ritual, historical

commemoration, and the teaching of tribal youth regarding traditional cultural sites and practices. As such, the Fort Bidwell tribe has identified the following concerns/effects relating to the construction of the Ruby pipeline within the potential TCP:

- the potential of the pipeline to impact all species of concern within the pipeline corridor, especially large game and marmot;
- the potential of construction of the pipeline to affect migration patterns of big game, principally deer, a chief form of sustenance to the tribal community;
- the effect of construction and blasting on the marmot (The Fort Bidwell Tribal Band name is Gidutikad, which translates to groundhog eater), a particularly symbolic species for the tribe;
- the extirpation of game species and yampah patches, which has the potential to adversely impact not only the food security of the Fort Bidwell Paiute community, but also social cohesiveness and cultural continuity within this community;
- the possibility of permanent alteration of groundwater and adverse effect of construction on two springs that are places of importance but located outside of the pipeline corridor;
- expected destruction of multiple stacked rock features and the pipeline's proximity to a number of places reported to be used for cultural purposes by tribal members;
- adverse effect to the sensory experiences of individuals who might visit the area for ceremonial or other purposes; and
- certain effects, mainly those affecting the spiritual values of place, cannot be mitigated.

In a letter dated November 5, 2009 addressed to the FERC, Aaron Townsend, Tribal Chairman of the Fort Bidwell Indian Community, requested consultation with federal decision-making authorities in order to protect the Barrel Springs area.

The BLM states that both the preliminary summary report and discussions between the Fort Bidwell Tribe and the BLM SFO provide supportive information that the Barrel Springs area represents a TCP to the tribe. The BLM has indicated that it is prepared to determine the Barrel Springs TCP as eligible for listing in the NRHP under Criteria A, C, and D. The boundaries of the Barrel Springs TCP closely match what the BLM's Surprise Field Office considers to be the new boundaries of the Rock Creek Archaeological District. In its ongoing permitting process, the BLM states that it would recommend that Ruby continue to work with the BLM and the Fort Bidwell Tribe to develop additional alternatives that minimize impacts on the Barrel Springs TCP.

Ruby provided an interim report of ethnographic study for the Shoshone and Paiute of the Duck Valley Indian Reservation and the Fort McDermitt Indian Reservation prepared by Dr. Deward E. Walker, Jr. Dr. Walker interviewed tribal members, including tribal elders, in their homes and during visits to sites. The report indicates that both tribes have concerns regarding culturally significant sites and species along the length of the pipeline corridor. The Shoshone and Paiute believe that pipeline construction and maintenance threatens to open their homelands and resources to additional injury that would affect cultural properties that until now have been isolated from extensive impacts from non-Indian activities. Rock art, massacre, and battle site locations are cited as especially significant cultural resources. The tribes' ethnographer reports that many tribal respondents are reluctant to provide specific site locations of culturally sensitive sites, because the location of the pipeline corridor is not perceived as fixed and the release of specific locational information and concomitant spiritual information is not protected through binding memoranda of agreement between the FERC, BLM, SHPO and Ruby.

The tribes report general concerns regarding the degradation of biotic species through construction and maintenance of the pipeline, which would in turn affect their ability to follow traditional

practices associated with hunting, gathering, and religious ceremony. The tribes are further concerned that construction of the pipeline would disturb human remains and disrupt the spiritual integrity of place, which can in turn affect the well-being of the community and lead to social problems such as unemployment, substance abuse, and suicide. The ethnographic study summarizes that the three factors of cultural species variability, place integrity, and tribal community well-being must be considered in order to mitigate the adverse effects of pipeline construction. Other than the recorded TCPs of Santa Rosa Mountains and Paradise Valley noted above, two additional locations – Fort Ruby and Gravelly Ford – were identified as potential TCPs. It is not known if these locations are within the project construction area, and the criteria for NRHP eligibility as TCPs have not been applied to them. Both locations are associated with Indian massacres, but this alone would not make a site eligible as a TCP.

The Summit Lake Paiute Tribe of Nevada indicated that it preferred to conduct its own internal ethnographic study. The Summit Lake Paiute Tribe reservation is located just south of the pipeline route in northwestern Nevada; however tribal members live across the region. As part of a cost recovery program, Ruby provided funding that enabled the tribe's Acting Environmental Coordinator, Mr. Ron Johnny, to conduct six regional information sessions/meetings in the spring of 2009 in Idaho, California, Nevada, and Oregon. The goal of Mr. Johnny's study was to identify cultural resources important to the tribe, including the locations of natural resources with cultural significance, spiritual places, and burial sites. While the resulting report itemized the use of the funds for the meetings, purchases, and other activities unrelated to an ethnographic study, it contained no ethnographic analysis nor information on TCPs, and concluded "although the cultural importance of the area of the proposed pipeline was confirmed…permission to reveal exact locations for such resources was not given to the Council during any of the regional project site meetings unless the resources are actually threatened with destruction by Ruby."

4.10.1.4 Oregon

Ruby conducted a literature review and pedestrian survey of about 86.9 miles of the pipeline route, 60.8 miles of centerline reroutes, and 77.5 miles of access roads in Oregon. The survey identified a total of 141 archaeological sites within the survey corridors, with 108 of these sites recommended as eligible for the NRHP. Thirty-three of the NRHP-recommended eligible sites are located within the project construction corridor; avoidance is recommended for 12 of these sites. Ruby proposed that there would be an adverse effect to the remaining 21 sites and mitigation was recommended. Sites that cannot be avoided would be mitigated in coordination with the appropriate land managing agencies, the Klamath Tribes, and the Oregon SHPO.

Site types identified include lithic scatters (which constituted the majority of site types found), many with tools and/or rock features; rock features/stacks; a peeled tree site; aspen carvings; a historic rock fence; historic roads; and a limited number of historic trash scatters, some including lithic scatters. Rock features/stacks are an especially significant site type to the Klamath Tribes (see section 4.10.3.1). The Klamath Tribes and the BLM expressed significant concerns over the Antelope Creek Area, which is being researched for nomination to the NRHP as an archaeological district based on its rich archaeological and religious landscape values. Reclamation also commented that portions of the Klamath Project, a NRHP-eligible property, would be crossed by the original proposed pipeline route. The original pipeline route would cross the Main Drain, as well as the West Canal, and the Lost River Improved Channel of the Klamath Project. We recommended in the draft EIS that Ruby adopt the Southern Langell Valley Route Alternative to avoid both the concentration of culturally sensitive sites in the proposed ACAD and the irrigation features of the Klamath Project. Ruby has subsequently adopted this route alternative (section 3.4.15). The BLM indicates that review of the preliminary archaeological and ethnographic reports (discussed below) and BLM consultation with the Klamath Tribes suggests that there are considerably more sensitive sites, including rock stacks, along the adopted Southern Langell

Valley Route Alternative than along the originally proposed route. In addition, the BLM believes that the boundaries of the ACAD should be expanded to the south. Thus, the current route would now also cross the proposed district.

Ruby submitted a draft report documenting the literature review and pedestrian survey to the FERC, BLM, Reclamation, USFS, and Oregon SHPO in March 2009. The BLM, Reclamation, and FERC commented on the draft report and requested additional information and revisions. In a letter dated March 3, 2009, the Oregon SHPO requested additional information in order to complete its review. Ruby submitted a revised draft report in July 2009. The BLM, Reclamation, and the USFS have reviewed the July 2009 report; these agencies requested corrections to the report and site forms and have not yet made determinations of eligibility for properties under their respective jurisdictions.

In a subsequent September 3, 2009 letter, the Oregon SHPO commented on Ruby's need to address TCPs; requested information on alternative routes; noted the ACHP's participation; requested information on the potential impact on archaeological sites caused by blasting; and expressed concern about project scheduling. Ruby has not yet addressed the SHPO's comments.

In September 2009 Ruby submitted four draft addenda to the main survey report distributed in July 2009: 1) an addendum report of survey for 320 additional acres of pipe yards, construction yards and the Malin lateral; 2) a second addendum report of survey for 1,718 additional acres of 35.5 miles of centerline (including the Goose Lake, Langell Valley, and Big Valley reroutes) and 35.3 miles of access roads; 3) a third addendum report of survey for 35 acres for the proposed Lakeview housing facility; and 4) the geoarchaeological study of the pipeline route in Oregon. The first addendum report identified an additional 10 sites including prehistoric lithic scatters, an historic trash scatter, historic railroad features, a lumberyard, and a canal. Six of the sites were recommended as eligible for the NRHP, three were recommended as ineligible, and one required further evaluation. Eight of these sites were located within the project construction area including five eligible sites, two ineligible sites, and the unevaluated site. Ruby proposed that there would be an adverse effect to the five eligible sites, and data recovery was recommended. Further testing was recommended for the unevaluated site. The second addendum report identified an additional 57 sites, the majority of which consisted of prehistoric lithic scatters (some with rock stacks, tools, groundstone, and/or features) and rock stacks; historic trash scatters; a canal; a corral; and a telegraph line. Thirty-six of the sites were recommended as eligible for the NRHP, 6 were recommended as ineligible, and 15 required further evaluation. Forty-six of these sites were located within the project construction area including 30 eligible sites, 6 ineligible sites, and 10 unevaluated sites. Ruby indicated that impacts on 32 of the eligible sites could be avoided, 4 eligible sites would be adversely affected and require mitigation, and further testing was recommended for the 10 unevaluated sites. As a result of survey of the Lakeview housing facility, one historic trash scatter was identified and recommended as not eligible for the NRHP. However, a portion of the facility remains to be surveyed. The geoarchaeological study concluded that subsurface excavation in moderate and high probability areas should be monitored. The report addenda are under review.

An assessment of the visual impacts on historic properties for Oregon has not been filed with FERC. Ruby also conducted additional fieldwork in July 2009 to evaluate the possible use of ground-penetrating radar or other geophysical methods to identify culturally sensitive sites around Goose Lake. The findings of any resulting studies would be reported in addenda to the main report.

We received additional comments from the SHPO in November 2009. The SHPO noted receipt of the addendum reports and the need for additional studies in order to determine eligibility; expressed concern over impacts on TCPs and other outstanding issues; and indicated that this additional information was required in order for it to concur on effects to cultural resources, and that the consultation process was ongoing. Ruby has not yet addressed the SHPO's comments.

Ruby initiated an ethnographic study of the Antelope Valley area with the Klamath Tribes, and provided a preliminary summary report prepared by Dr. Douglas Deur. Dr. Deur, who has served as the tribe's ethnographer since 1998, interviewed 33 individuals for this study. The summary report indicates that the Antelope Valley presents some issues for ascription as a TCP. As its integrity of association with current practice is somewhat unclear, it may not be eligible for listing in the NRHP as a TCP. However, the report recommends further detailed study of the area for potential NRHP listing as either a single archaeological district or several archaeological districts that would encompass the rock stacks; the BLM has indicated that a multiple property NRHP listing may alternatively be appropriate. Additional survey work would be needed to define the boundaries of the district(s) before a formal nomination could occur. In its ongoing permitting process, the BLM states that it would recommend the use of tribal monitors for future archaeological investigations of this area.

The preliminary results of the ethnographic study report the Klamath Tribes' concerns with adverse impacts of the pipeline to the area around Antelope Valley, as well as Goose Lake. Both areas possess archaeological sites and features, including ceremonial rock stacks considered sacred by many tribal members, and also have a high likelihood of burials. Construction of the pipeline would likely destroy one or more rock stacks; if avoidance is not possible, mitigation would need to be developed and evaluated in consultation with the Tribes and appropriate land managing agencies. The section of pipeline passing through Oregon is also believed to pass through traditional plant gathering, hunting and fishing areas of the Klamath Tribes. The Klamath people regard the mule deer, which migrate yearly between California and Oregon (the "Interstate Herd"), as a significant traditional food source. The Klamath Tribes believe that certain effects, mainly those affecting the spiritual values of place, cannot be mitigated.

In a letter dated November 17, 2009, the Field Manager of the BLM Klamath Falls Resource Area expressed his support for the preliminary report submitted by Dr. Deur. The BLM indicated that it appreciated the additional information about the cultural significance of the rock sites which provided a context and better understanding of their importance to the Klamath Tribes. The BLM further described the ethnographic study as an excellent example of carrying out Section 106 while addressing tribal concerns.

4.10.2 Unanticipated Discovery Plans

Ruby has prepared draft Unanticipated Discovery Plans for each state to provide guidelines in the event that cultural resources, including human remains, are discovered during the course of construction. The plans call for monitoring all construction and include protocols for discovery of human remains. Each plan contains procedures for stopping work, protecting the discovery, notifying the proper authorities, and consulting with the appropriate parties.

The draft Unanticipated Discovery Plans were provided to the FERC, SHPOs, BLM, and other agencies. We requested revisions to the draft plans for each state. The Elko District Office of the BLM submitted comments to Ruby on the draft Unanticipated Discovery Plan for Nevada. The Winnemucca District Office of the BLM has commented on two draft versions of the Unanticipated Discovery Plans for Nevada. To date, the only SHPO office that has concurred with the Unanticipated Discovery Plan is Oregon. The revised Unanticipated Discovery Plans are currently under review, and would be updated by Ruby as needed.

4.10.3 Native American Consultation and Ruby Tribal Coordination

Native American consultations and contacts by the FERC, BLM, and Ruby are summarized in table 4.10.3-1 and further discussed in this section.

On March 28, 2008, the FERC mailed a *Notice of Pre-Filing Environmental Review for the Ruby Pipeline Project, Request for Comments on Environmental Issues and Notice of Public Scoping Meetings* to numerous stakeholders, including 40 federally recognized Native American tribes. This notice initiated government-to-government consultation, invited the Native American tribes to formally cooperate with FERC in preparation of this EIS, and requested comments on the proposed project.

In April 2008, the FERC and BLM sponsored six interagency meetings (see table 4.10.3-1). We contacted 31 federally recognized Native American tribes by email or fax prior to these meetings to inform them of the meeting times and locations and solicit their attendance. We also followed-up the e-mails and faxes with telephone calls. Four tribes attended one or more of the meetings.

On September 26, 2008, we mailed a *Notice of Intent to Prepare an Environmental Impact Statement and Land Resource Management Plan Amendment for the Proposed Ruby Pipeline Project, Request for Comments on Environmental Issues and Notice of Public Scoping Meetings* to project stakeholders, including the 40 federally recognized Native American tribes who received the previous notice. To date, we have received written comments from 14 tribes. In addition to those tribes, the Bureau of Indian Affairs and California Native American Heritage Commission provided written comments on the project. Many of the comments from tribes included concerns about government-to-government consultation, impacts on natural and cultural resources, as well as treatment of human remains. We also received written comments supporting the project from tribes outside the pipeline stakeholder territory. The Southern Ute Indian Tribe and the Ute Mountain Ute Tribe, both energy providers in Colorado, requested approval of the draft EIS in order to open up markets on the West Coast. The Council of Energy Resource Tribes, a consortium of 54 U.S. Indian Tribes and four Canadian First Nation Tribes that promotes partnerships between tribes and energy companies, provided written comments urging acceptance of the draft EIS.

On October 27 and 28, 2008, FERC staff met with members of the Summit Lake Paiute Tribe, Reno-Sparks Indian Colony, Pyramid Lake Paiute Tribe, and the Fort Bidwell Paiute Tribe to discuss the project. Topics of discussion included the FERC's policies regarding government-to-government consultation, impacts on cultural resources, and concerns about the natural resources traditionally used by the tribes that may be affected by pipeline construction.

TABLE 4.10.3-1

Native American Consultations for the Ruby Pipeline Project

Federally Recognized Native American Tribe	FERC Notice (March and September 2008)	FERC Meeting (April 2008)	Ruby Letter (May 2008 and January 2009)	Ruby Meeting (July, September, November 2008)	FERC Meeting (October 2008)	BLM Letter (2009)					BLM Meeting (2009)		Ruby State Survey Report (2009)						Written Comments to FERC (All Dates)
						Jan	Apr	Jul	Sep	Nov	May	Oct	May	Jul	Aug	Sep	Oct	Nov	
Arapahoe Tribe of the Wind River Reservation, Wyoming	✓	*	✓			✓		✓											
Burns Paiute Tribe of the Burns Paiute Indian Colony of Oregon	✓	*	✓			✓	✓	✓	✓	✓	*								
Cedarville Rancheria, California	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓			✓			✓	✓	
Confederated Tribes of the Goshute Reservation, Nevada and Utah	✓	*	✓			✓		✓						✓		✓	✓	✓	
Confederated Tribes of the Siletz Reservation, Oregon	✓																		
Confederated Tribes of the Warm Springs Reservation of Oregon	✓	*	✓			✓		✓											
Cow Creek Band of Umpqua Indians of Oregon	✓	*	✓			✓		✓						✓		✓			
Death Valley Timba-Sha Shoshone Band of California	✓	*	✓			✓		✓											✓
Duckwater Shoshone Tribe of the Duckwater Reservation, Nevada	✓	*	✓			✓	✓	✓	✓	✓	✓	✓							
Ely Shoshone Tribe of Nevada	✓	*	✓			✓	✓	✓	✓	✓	*								
Fort Bidwell Indian Community of the Fort Bidwell Reservation of California	✓	*	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓
Fort McDermitt Paiute-Shoshone Tribe, Fort McDermitt Reservation, Nevada and Oregon	✓	✓	✓			✓	✓	✓	✓	✓	*	✓	✓	✓	✓		✓	✓	✓
Hoopa Valley Tribe, California	✓																		
Karuk Tribe of California	✓																		
Klamath Tribes, Oregon	✓	*	✓	✓		✓	✓	✓	✓	✓	*	✓		✓		✓			✓
Lovelock Paiute Tribe of the Lovelock Indian Colony, Nevada	✓	*	✓			✓	✓	✓	✓	✓	*								

TABLE 4.10.3-1

Native American Consultations for the Ruby Pipeline Project

Federally Recognized Native American Tribe	FERC Notice (March and September 2008)	FERC Meeting (April 2008)	Ruby Letter (May 2008 and January 2009)	Ruby Meeting (July, September, November 2008)	FERC Meeting (October 2008)	BLM Letter (2009)					BLM Meeting (2009)		Ruby State Survey Report (2009)						Written Comments to FERC (All Dates)
						Jan	Apr	Jul	Sep	Nov	May	Oct	May	Jul	Aug	Sep	Oct	Nov	
Moapa Band of Paiute Indians of the Moapa River Indian Reservation, Nevada	✓																		✓
Modoc Tribe of Oklahoma	✓	*	✓			✓		✓											
Northwestern Band of Shoshoni Nation of Utah (Washakie)	✓	*	✓			✓		✓											
Paiute Indian Tribe of Utah	✓	*	✓			✓		✓						✓	✓	✓			
Paiute-Shoshone Tribe of the Fallon Reservation and Colony, Nevada	✓	*	✓			✓	✓	✓	✓	✓	✓	✓							
Pit River Tribe, California	✓	*	✓			✓		✓											✓
Pyramid Lake Paiute Tribe of the Pyramid Lake Reservation, Nevada	✓	*	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓		✓	✓	✓
Quartz Valley Indian Community of the Quartz Valley Reservation of California	✓																		
Reno-Sparks Indian Colony, Nevada	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓
Shoshone Tribe of the Wind River Reservation, Wyoming	✓	*	✓			✓		✓											
Shoshone-Bannock Tribes of the Fort Hall Indian Reservation of Idaho	✓	*	✓			✓		✓											
Shoshone-Paiute Tribes of the Duck Valley Reservation, Nevada	✓	*	✓			✓	✓	✓	✓	✓	✓	✓		✓	✓	✓			✓
Skull Valley Band of Goshute Indians of Utah	✓	*	✓			✓		✓											
Southern Ute Indian Tribe, Colorado																			✓
Summit Lake Paiute Tribe of Nevada	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	✓
Susanville Indian Rancheria, California	✓	*	✓	✓		✓	✓	✓	✓	✓	✓			✓			✓	✓	✓

TABLE 4.10.3-1

Native American Consultations for the Ruby Pipeline Project

Federally Recognized Native American Tribe	FERC Notice (March and September 2008)	FERC Meeting (April 2008)	Ruby Letter (May 2008 and January 2009)	Ruby Meeting (July, September, November 2008)	FERC Meeting (October 2008)	BLM Letter (2009)					BLM Meeting (2009)		Ruby State Survey Report (2009)						Written Comments to FERC (All Dates)
						Jan	Apr	Jul	Sep	Nov	May	Oct	May	Jul	Aug	Sep	Oct	Nov	
Te-Moak Tribe of Western Shoshone Indians of Nevada	✓	*	✓	✓		✓	✓	✓	✓	✓	✓	✓		✓			✓	✓	
Ute Mountain Ute Tribe, Colorado																			✓
Ute Indian Tribe of the Uintah and Ouray Reservation, Utah	✓	*	✓			✓		✓											✓
Walker River Paiute Tribe of the Walker River Reservation, Nevada	✓													✓					
Washoe Tribe of Nevada and California	✓	*	✓			✓		✓									✓	✓	
Winnemucca Indian Colony of Nevada	✓	*	✓			✓		✓				✓							
Yerington Paiute Tribe of the Yerington Colony and Campbell Ranch, Nevada	✓		†	✓		✓	✓	✓	✓	✓	*								
Yomba-Shoshone Tribe of the Yomba Reservation, Nevada	✓	*	✓	✓		✓	✓	✓	✓	✓	*								
Yurok Tribe of the Yurok Reservation, California	✓													✓					

✓ Letter, notice, report recipient, meeting attendee, or letter author.
* Received invitation to meeting, but did not attend.
† First letter sent in November 2008.

We sent the draft EIS to 209 representatives and/or individual members of the tribes listed in table 4.10.3-1, as well as other Native American organizations (as listed in Appendix A of the draft EIS). The NOA contained in the draft EIS also announced public scoping meetings for the draft EIS, and invited recipients of the draft EIS to attend the meetings to express their concerns. A number of tribal members attended the scoping meetings, as discussed below. In addition, the FERC staff has continued our dialogue with tribes by responding to inquiries via further telephone and email contacts/communications. Additionally, formal responses issued by the Acting Director of the FERC's Office of External Affairs were sent to: the Chairman of the Fort Bidwell Northern Paiute Tribe (letter dated January 6, 2009), addressing issues raised in an October 2, 2008 letter; the Chairman of the Reno-Sparks Indian Colony (letter dated September 17, 2008), addressing issues raised in an August 21, 2008 letter; and the Chairman of the Summit Lake Paiute Tribe (letters dated September 25 and November 20, 2008), addressing issues raised in August 16 and October 28, 2008 letters, respectively. These responses clarified the FERC's environmental review processes and articulated the FERC's tribal consultation policies. We also provided a project status summary (letter dated February 12, 2009), including status of consultation with tribes, to the ACHP in response to a January 13, 2009 ACHP inquiry. A FERC staff member also gave a presentation at the February 2009 Center for Legal Education Conference on Historic Preservation in Denver (further discussed below) describing the FERC process and procedures for conducting Section 106, and also attended an ad-hoc session to listen to tribal concerns.

We have conducted ongoing discussions (during the pre-filing process and following the submittal of Ruby's FERC application) with tribal representatives regarding how each agency conducts government-to-government consultations. Given the concerns expressed by some tribes, and in order to ensure that its tribal consultation requirements are being met, the BLM took steps to conduct tribal consultation beyond the joint FERC/BLM efforts. In accordance with NEPA, Section 106 of the NHPA, Executive Order 13175, and other laws, regulations, secretarial orders, *etc.,* the BLM is conducting consultation on this project with the identified potentially affected tribes. The BLM conducts consultation activities in accordance with the BLM Handbook 8120-1, *Guidelines for Conducting Tribal Consultation*, which provides the following direction regarding tribal consultation: "(1) that federally recognized tribal governments and Native American individuals, whose traditional uses of public land might be affected by a proposed BLM action, would have sufficient opportunity to contribute to the decision, and (2) that the decision maker would give tribal concerns proper consideration" (BLM, 2004b). Generally, BLM consultation is conducted at the field office and district office levels as a responsibility of the appropriate BLM Manager; BLM managers may also rely on BLM archaeologists, tribal coordinators and other staff to obtain information from tribal cultural resources office staff, historic preservation officers and council officials. Consultation on the project has taken the form of field visits, BLM presentations to tribal council meetings, phone calls, emails and routinely scheduled meetings to solicit tribal input on BLM policy

On January 26, 2009, the BLM sent letters to 31 Native American tribes and four bands of the Te-Moak Tribe (the Elko Band Council, the South Fork Band Council, the Battle Mountain Band Council, and the Wells Band Council). This letter provided project information, defined the roles of the various involved agencies, clarified the BLM's role and objectives in government-to-government consultation, and invited the tribes to participate in consultation to elicit concerns regarding the project. The BLM has followed up with telephone calls to the tribes, and has arranged and attended meetings with those tribes that have requested them. Some of these meetings have been held in conjunction with cultural resource presentations made by Ruby and its cultural resources consultant, EPG. General concerns voiced in these meetings focused on the articulation of FERC and BLM's environmental and cultural resources review practices. On April 1, 2009, the BLM Klamath Falls Resource Area coordinated a meeting between the Klamath Tribes and Ruby to discuss potential rerouting of the pipeline to avoid impacts on the NRHP-eligible ACAD located on BLM Klamath Falls Resource Area lands. At the Reno-Sparks Indian

Colony's request, on April 23, 2009, the BLM sent letters to 20 tribes, inviting them to a meeting to continue government-to-government consultation, provide additional project information and updates, and answer questions about the project. The Reno-Sparks Indian Colony assisted in coordinating the meeting in Reno, which took place on May 19, 2009. On September 15, 2009 BLM sent letters to the same 20 tribes that attended the meeting in Reno to extend an invitation to another information meeting. The meeting was held on October 8, 2009 in Winnemucca. At this meeting, the tribes in attendance voiced concerns regarding the collection of artifacts on BLM lands during pedestrian archaeological survey of the corridor and declined to hear the BLM's presentation on the status of the pipeline project. The tribes caucused as a group and presented the BLM with nine points to be addressed by the Nevada State Office. The Nevada State Office responded to all 20 tribes with a letter addressing the nine points on November 12, 2009 and followed up with enclosures of meeting minutes and contact information for field offices on November 17, 2009.

Government-to-government consultation would continue to take place throughout the project, and continuing information and concerns provided by Native American tribes would be addressed through the Section 106 process as they are identified. Confidential information, such as the location and character of historic properties or culturally sensitive areas, would be used in the decision-making process but would not be made available to the public; this information would be protected to the full extent of the law.

Ruby, as authorized by the FERC, and in accordance with 36 CFR 800.2(a)(3) and 36 CFR 800.2(c)(4), also contacted Native American tribes who may claim traditional land in the project area and may attach religious and cultural significance to locations within the proposed pipeline route. Ruby's contractor EPG initially sent a letter to 31 Native American tribes on behalf of Ruby in May 2008. The letter described the proposed activities related to the project and invited comment regarding potential impacts on known cultural resources as a result of the project. EPG followed-up with recipients to verify receipt and solicit comments. EPG sent the letter to one additional tribe in November 2008. In July, September, and November 2008, Ruby met with 10 tribes to discuss the project.

Ruby sent a second project letter to 32 tribes on January 7, 2009. The second letter requested specific information about culturally sensitive resources, such as medicinal plants or sacred sites known to the tribes that might be impacted by the project. In addition to letters sent by their contractors, Ruby has undertaken significant outreach activities to interact with Native American tribes. The Executive Director of the Council of Energy Resource Tribes has stated that " . . . [Ruby] has engaged in more and better Tribal outreach on the . . . project than I have ever seen any energy company do in more than 30 years of working on Indian energy development" (in a letter dated August 4, 2009).

In addition to letters, Ruby has communicated with Native American tribes throughout the project by telephone, email, fax, and face-to-face meetings, including site visits to locations along the pipeline route. The face-to-face meetings that Ruby has conducted with tribal members since filing their certificate application with the FERC on January 27, 2009 are summarized below:

- On January 27, 2009, Ruby held a meeting at the BLM offices in Klamath Falls, Oregon to discuss the findings of the Class III survey in Oregon, especially the culturally sensitive sites in the Antelope Creek area. Two representatives of the Klamath Tribes, Perry Chocktoot and Les Anderson, attended the meeting and expressed their concerns about disturbing the many rock stack sites identified during the survey. BLM archaeologists stated that the pipeline centerline crossed the proposed Antelope Creek Archaeological District, which is associated with the historic Klamath Tribes. During the course of this meeting, Ruby representatives committed to changing the pipeline route.

- On February 20, 2009, Ruby arranged a meeting with the Summit Lake Paiute Tribe in their offices in Sparks, Nevada. Ron Johnny and William Cowan attended the meeting as representatives of the Summit Lake Paiute Tribe. Melinda Dollarhide of the Cedarville Rancheria also attended the meeting. Discussion at this meeting focused on environmental issues, such as noxious weed control and trash disposal. Ron Johnny stated that the Summit Lake Paiute Tribe members hunt in their ancestral territory, including the area of the pipeline route. In this regard, he requested that Ruby notify the tribe prior to construction.

- On March 4, 2009, Ruby held a meeting with the Te-Moak Shoshone Tribal Council at their tribal offices in Elko, Nevada. Ruby presented project updates and answered questions from the nine tribal members in attendance. The Te-Moak Tribe requested a visit to the pipeline corridor, and better maps depicting the location of the pipeline.

- On March 6, 2009, Ruby met with the Skull Valley Band of Goshute Tribal Council at their tribal offices in Ibapah, Utah. They presented project updates and answered questions from the six tribal members in attendance. The tribe requested additional cultural information and periodic project updates.

- On March 26, 2009, Ruby met with the Lovelock Paiute Tribe at their tribal offices in Lovelock, Nevada. Ruby provided information about the project, and answered questions from the two tribal members in attendance. The Lovelock Paiute Tribe stated that the pipeline was not close to their reservation, but they would like to continue to receive information.

- On March 31, 2009, Ruby met with the Northwestern Band of the Shoshoni in their tribal offices in Salt Lake City, Utah. Ruby provided information about the project to the two tribal members, and Shoshone Energy representative in attendance. Michael Devine of the Northwestern Shoshoni explained that the tribe is knowledgeable about energy production and planned to meet with other tribes about energy projects.

- On April 1, 2009, Ruby met with Perry Chocktoot and Les Anderson of the Klamath Tribes. The BLM and Reclamation were also at this meeting, where alternative routes through the Antelope Creek area were discussed. Several alternate routes were examined; Ruby expressed their intention to avoid the proposed ACAD.

- On April 14, 2009, Ruby met with Chairman Dale Barr of the Fort McDermitt Paiute-Shoshone Tribe and the Tribal Council, and Michon Eben of the Reno-Sparks Indian Colony. This meeting was held in the Fort McDermitt tribal office in McDermitt, Nevada. Michon Eben gave a presentation about the project and the NEPA process was discussed.

- On May 8, 2009 Ruby organized a conference call meeting to discuss the tribal ethnographic studies. Members of the Reno-Sparks Indian Colony, Fort Bidwell Paiute Tribe, Klamath Tribes, Fort McDermitt Paiute-Shoshone, and Shoshone Paiute of Duck Valley were in attendance, as well as the ethnographers. Several topics were discussed: the purpose of the studies; the study areas; the format of the studies; and confidentiality.

- On July 7, 2009 Les Anderson of Ruby met with Kenneth Sam of the Fort Bidwell Tribe and Pacific Legacy for a field visit to Wall Canyon Creek and Cottonwood Creek. They

met with the Pacific Legacy crew that was surveying in the area and spoke with James Barlese and Chris Brown, members of the Summit Lake Paiute Tribe who were serving as tribal monitors on the survey.

- On July 10, 2009 Les Anderson met with Kenneth Sam of the Fort Bidwell Paiute Tribe and Elder Furman Sam of the Summit Lake Paiute Tribe. They made a field visit to the Summit Lake Paiute Reservation and several canyons.

- On July 14, 2009 Ruby met with the Tribal Council of the Wells Band Indian Colony of the Te-Moak Tribe of Western Shoshone. The group made a field visit to recorded archaeological sites in Nevada after listening to project updates at the tribal council offices.

- On July 15, 2009 Ruby met with Bernice Lalo and Edith Cybo of the Battle Mountain Band of the Te-Moak Tribe of Western Shoshone. Ruby provided updated project information and committed to arranging a future field visit.

- On July 16, 2009 Ruby met with the Reno-Sparks Indian Colony and the Tri-Basin Cultural Committee at the Reno-Sparks tribal offices in Reno, Nevada. Les Anderson explained his position as Ruby's Tribal Coordinator, and offered assistance with project concerns.

- Following the FERC public comment meeting in Elko, Nevada on July 29, 2009, Ruby met with members of the Elko, Battle Mountain and Wells Bands of the Te-Moak Tribe of Western Shoshone, and members of the Fort McDermitt Paiute and Shoshone Tribes. Ruby answered questions and arranged for future field visits.

- On August 10, 2009 Les Anderson of Ruby met with Tribal Chairman Dale Barr of the Fort McDermitt Paiute and Shoshone Tribes in Reno, Nevada. Anderson offered additional project information and offered to arrange for a site visit.

- Les Anderson of Ruby met with members of the Fort Bidwell Indian Community on August 18 and 27, 2009. Mr. Anderson introduced his role as Tribal Coordinator for the project and offered assistance with tribal concerns.

Ruby continued to conduct meetings in the subsequent months, and has committed to meetings and site visits as needed throughout the project timeframe. Ruby would coordinate tribal communication, including letters, emails, telephone calls, faxes, and meetings to address tribal concerns throughout the course of the project.

During the Center for Legal Education Conference on Historic Preservation in Denver in February 2009, Ruby met with several tribal members in an ad-hoc session to discuss the Ruby Pipeline Project. Ruby also provided funding for a number of tribes' members to attend this conference.

From July 20 to 21, 2009, Ruby sponsored an event in Reno, Nevada titled "Bear Talk: An Energy Discussion for Tribes along the Ruby Pipeline Route." The Council of Energy Resource Tribes organized and moderated the event, which discussed national energy policy and the potential benefits of energy production to Native American tribes. More than 70 tribal members attended the event, representing the following tribes: the Summit Lake Paiute Tribe; the Fort Bidwell Indian Community; the Susanville Indian Rancheria of California; the Pyramid Lake Paiute Tribe; the Shoshone-Paiute Tribes of

the Duck Valley Reservation; the Paiute-Shoshone Tribe of the Fallon Reservation; the Death Valley Timbisha Shoshone Tribe; the Wells Band, Elko Band and Battle Mountain Band Councils of the Te-Moak Tribe of Western Shoshone; the Fort McDermitt Paiute-Shoshone Tribe; the Ute Mountain Ute Tribe; the Ute Indian Tribe of the Uintah and Ouray Reservation; and the Reno-Sparks Indian Colony. Chairman Warner Barlese of the Summit Lake Paiute Tribe stated that the majority of Northern Paiute tribes did not agree with the culture and philosophy of the event's meetings, and that "not disturbing important, historic, cultural and other resources…is more important than the benefits [Council of Energy Resource Tribes'] natural gas selling members will receive" (in a letter to FERC dated August 10, 2009).

In June 2009 Ruby contractor EPG hired Les Anderson as a Native American Coordinator. He is a member of the Modoc Tribe and has most recently served on the cultural resources staff of the Klamath Tribes. In a letter dated August 5, 2009 sent to the 32 tribes with traditional ties to the project location, Mr. Anderson explained his new role of conducting outreach to Native American tribal leaders on behalf of Ruby. In response to requests from several tribes, Ruby sponsored a tribal monitor training session facilitated by Mr. Anderson on August 4, 2009. More than 20 tribal members attended and 3 attendees joined the archaeology crews working in Nevada the next day. A special advisory committee of 12 trained tribal members was organized as a result of the training and would be available to assist Ruby as needed. In his capacity of Native American Coordinator for Ruby, Mr. Anderson has continued contact and communications with the tribes to provide information and elicit concerns.

On November 16, 17, and 18, 2009, Ruby sponsored three informational Tribal Workshops in Reno, Winnemucca, and Elko, Nevada, respectively. The workshops focused on tribal employment (union and non-union jobs, apprenticeships, and cultural resources technician/monitoring positions). The Reno meeting was attended by over 40 tribal members, the Winnemucca meeting was attended by approximately 45 tribal members, and the Elko meeting was attended by over 45 tribal members. Two more workshops are scheduled; one in Alturas, California (January 13, 2010), and one in Klamath Falls, Oregon (January 14, 2010).

At the request of several Native Americans, Ruby is conducting ethnographic studies as part of its tribal outreach. These studies are beyond the ethnographic research efforts required to prepare historic context background material for each state survey. Ruby is completing three studies that cover the geographical span of the project through four states. Thirty-two tribes were invited to participate in the studies; to date, six tribes are participating. Ethnographic studies may also be a source of information about TCPs. TCPs are NHRP-listed or -eligible historic properties that carry historical and contemporary meaning for tribes or other ethnic groups (Parker and King, 1990). TCPs are identified as part of the inventory phase of the Section 106 process, and impacts on TCPs must be mitigated. Ruby is working with the ethnographers conducting the studies to identify any potential TCPs as soon as possible so that such sites can be identified and evaluated. Ruby's tribal outreach efforts, as well as federal agency review of cultural resources reports, and other tribal consultation would occur until the EIS is published, and beyond as needed.

Many tribes have expressed concern regarding the proposed project. In response to these concerns, on May 19, 2009, the ACHP indicated in a letter to FERC, their intention to participate in Section 106 consultation for the project.

4.10.3.1 Native American Comments Received before Publication of the Draft EIS

Native American groups attach cultural meaning to geographical locations and natural resources within the project area. These traditional or sacred resources would be identified, evaluated, and mitigated in collaboration with the affected Native American tribe(s). Although the Ruby Pipeline Project does not cross any tribal reservation land, it traverses the documented traditional territories of the

Arapaho, Bannock, Ute, Eastern Shoshone, Western Shoshone, Northern Paiute, Modoc, and Klamath tribes. Some common concerns about the project expressed during tribal consultation before issuance of the draft EIS include:

- government-to-government consultation;
- tribal notification in the event that Native American human remains are discovered during the course of the project;
- tribal monitors during archaeological field surveys;
- tribal monitors during pipeline construction;
- completion of ethnographic studies;
- disturbance or destruction of native plant and animal species and habitats;
- destruction or damage to the undisturbed and pristine traditional Native American territory along the pipeline route; and
- protection of confidential and sensitive information. Tribal members are reluctant to reveal information about sacred or traditional locations.

Tribal comments and concerns received by FERC prior to publication of the draft EIS are summarized below.

The Cedarville Rancheria of California attended the April 23, 2008 agency scoping meeting in Lakeview, Oregon and expressed its concern about disturbance to traditional hunting and gathering locations.

The Washoe Tribe of California and Nevada expressed concern that tribal monitors were not present during pedestrian surveys, and recommended that tribal monitors are present during ground excavation. In addition, the Washoe Tribe requested and received a copy of the draft survey report.

The Confederated Tribes of the Warm Springs Reservation of Oregon commented that the tribe would like to be notified of any significant findings in their traditional territory.

The Cow Creek Band of Umpqua Indians requested information about the surveys in Oregon and a copy of the final survey report for their files.

The Ely Shoshone Tribe of Ely, Nevada inquired about an ethnographic study.

The Fort McDermitt Paiute-Shoshone Tribe expressed concern that the pipeline route would enter the tribe's property, and requested consultation. Duane Masters, Sr., a member of the tribe, attended the agency scoping meeting in Elko, Nevada, on April 15, 2008, and Tribal Chairman Arlo Crutcher attended the agency scoping meeting at Winnemucca, Nevada, on April 24, 2008. Ruby met with the tribe in April 2009, where the tribe expressed concerns about ancestral burial sites in the project area and its interest in using a tribal monitor. In May 2009, Ruby supplied the tribe with cultural resources survey reports at its request.

The Paiute Indian Tribe of Utah requested a copy of the survey report, and information about the project's progress.

The Shoshone Paiute Tribes of the Duck Valley Reservation, Nevada expressed its disappointment in the lack of appropriate government-to-government consultation with federal agencies. The tribe inquired about an ethnographic study, and has been communicating with Ruby during the

planning of these studies. The Tribe also expressed an interest in conducting a field review following the completion of the ethnographic studies.

Members of the Skull Valley Band of Goshutes stated that the pipeline was too far north to concern them; however, they would like to stay informed about the project.

The Susanville Indian Rancheria of California stated its support for the other sovereign nations, although they would not be directly affected by the project. The Susanville Indian Rancheria of California also expressed concern about human remains, recommended that paid Native American monitors be present during pedestrian surveys and the construction phase of the project, encouraged mutually agreeable mitigation, and expressed disappointment in the government-to-government consultation process.

The Summit Lake Paiute Tribe of Nevada commented on the project numerous times. The Tribe's reservation is located less than 1 mile south of the project area. The proposed pipeline corridor traverses through a 2-mile gap between the Sheldon NWR and the Summit Lake Paiute Reservation in northern Nevada. The tribe's traditional homeland and current hunting and gathering territory extends into the project area. Members of the Summit Lake Paiute Tribe have communicated their extensive concerns to federal agencies regarding the potential impacts of the project on their traditional territory and way of life. A tribal representative attended the April 24, 2008 agency scoping meeting at Winnemucca via conference telephone call. Concerns expressed by the Summit Lake Paiute Tribe include:

- disruption of the tribe's aboriginal homeland in Nevada and Oregon, where tribal members still gather plants and hunt;
- ceremonial and burial sites; Native American trails where Paiute peoples have traditionally traveled;
- graves, prayer sites, caves, fire rings, camps, petroglyphs, and traditional hunting and gathering locations;
- impacts on the Summit Lake Lahontan cutthroat trout fishery, bighorn sheep, antelope, greater sage-grouse, marmots, rabbits (including pygmy rabbits), golden eagles, and burrowing owls;
- wildlife habitat;
- vegetation including mountain mahogany, bitterbrush, big sage, wild rose, willow, and aspen;
- introduction of invasive noxious weeds;
- impacts on lakes and wetlands;
- impacts on the scenic landscape;
- alteration of or disturbance to the balance of nature that is important to the tribe;
- and attraction of vandals and thieves to the area.

In an August 16, 2008 letter to FERC, the Summit Lake Paiute Tribal Chairman requested that the FERC conduct meaningful government-to-government consultation, and expressed concern that pipeline construction could destroy historic tribal properties, including possibly graves, and would disrupt his tribe's rights to hunt, gather traditional plants, and practice religious ceremonies. The FERC's Director of the Office of External Affairs responded with a letter dated September 17, 2008. This letter explained that the Ruby project was in the pre-filing stage, and that opportunities for tribal input would be provided throughout the review process. The Summit Lake Paiute Tribe filed a series of Tribal Council Resolutions with FERC on October 28, 2008. These resolutions conveyed the tribe's opposition to the planned route of the Ruby Pipeline Project.

The Summit Lake Paiute Tribe also filed multiple letters commenting on Ruby's draft resource reports detailing the tribe's many concerns about the construction of the pipeline through its ancestral territory including: destruction or disturbance of natural and cultural resources; impact on traditional Northern Paiute foods, medicines, and other current or historic subsistence resources; and failure to provide adequate control for noxious non-native plants. Ruby would be responsible for ensuring successful revegetation of soils disturbed by construction activities. Seedbed preparation and mixtures are defined in Ruby's draft Restoration and Revegetation Plans (Appendix L), and seeding would be performed in collaboration with the NRCS, local soil conservation authorities, landowners/land managing agencies, and interested tribes, as appropriate. Restoration in agricultural areas also may include the mitigation measures discussed above. We discuss the project's impacts on agricultural areas in section 4.8.1.3.

Several animal species that are historical and modern subsistence food for the Summit Lake Paiute Tribe currently range in the tribe's traditional territory between the reservation and the Sheldon NWR. The Lahontan cutthroat trout has an especially spiritual meaning for the tribe. Tribal members have expressed their concerns about project impacts on their traditional wildlife and hunting rights. The tribe's December 10, 2008 letter requested that Ruby conduct a current inventory of wildlife along the proposed route. The tribe indicated it has knowledge about the wildlife of this region, but that Ruby had not spoken with them to that point. The tribe also stated that the 2-mile space between the Sheldon NWR and the Summit Lake Paiute Reservation is an important wildlife area that deserves more careful study. Ruby would be responsible for eliminating or minimizing impacts on the fish and land animals important to the Summit Lake Paiute Tribe in cooperation with the tribe, landowners, and land managing agencies. We discuss the project's impacts on the Lahontan cutthroat trout in section 4.7.2.2.

The Summit Lake Paiute Tribe also expressed concern that the reservation's water source, One Mile Spring, would be impacted by construction and operation of the pipeline. Ruby would be responsible for assuring that the tribe's water source is not adversely affected by the pipeline and would follow the proper permitting channels if ground or well water that would affect the tribe's water source is used. Potential impacts on One Mile Spring are discussed in section 4.3.1.3.

The Pyramid Lake Paiute Tribe submitted comments in support of the Summit Lake Paiute Tribe's stance opposing the location of the pipeline so close to the Summit Lake reservation; repeating most of the concerns expressed by the Summit Lake Paiute Tribe; expressing concern about looting if new roads are built to construct the pipeline along traditional Northern Paiute lands; and regarding the destruction of locations of ceremonial practices that still take place today. Representatives of the Pyramid Lake Paiute Tribe attended the October 28, 2008 FERC meeting.

The Pit River Tribe of California was added to the list of tribes at the request of the Pyramid Lake Paiute Tribe. The Pit River Tribe expressed concerns about the effect the project would have on the traditional territory of the Northern Paiute and repeated most of the same issues raised by the Summit Lake Paiute Tribe.

The Fort Bidwell Indian Community has expressed concern that the project would damage its ancestral homeland including sacred sites and burial sites and also expressed disappointment in the government-to-government consultation efforts. The tribe also indicated it was aware of petroglyphs within the survey corridor, which were not reported in Ruby's application, and requested an ethnographic study, a copy of the survey reports, and the use of Native American monitors during and after construction. Representatives of Fort Bidwell have attended FERC scoping meetings and the October 28, 2008 FERC meeting. A representative of the Fort Bidwell Indian Community made a site visit to the location of the pipeline with other interested parties in early May 2009. Ruby indicated it was working

with the Fort Bidwell Indian Community to coordinate an ethnographic study and arrange for tribal monitors for future field surveys.

The Reno-Sparks Indian Colony expressed concern that traditional and sacred territory would be destroyed or disrupted by construction and operation of the pipeline along the proposed route. The Reno-Sparks Indian Colony has special concerns about the Native American items and information that are collected during the archaeological surveys and requested that recovered artifacts be returned to the Native American tribes of origin, and that no scientific study or destructive analysis be conducted on them. The Reno-Sparks Indian Colony also requested that no pictures, drawings, or depictions be made of any Native American human remains uncovered during the course of the project, and indicated that tribal permission would be required prior to cultural resources data being used for professional papers. The tribe also expressed its dissatisfaction with the government-to-government consultation for the project.

The Klamath Tribes of Oregon attended a cultural resource meeting in Oregon on April 8, 2008. The Klamath Tribes provided archaeological technicians for Ruby's Class III survey of the proposed pipeline route through Oregon. The Klamath Tribes recognize the area around Antelope Creek, Oregon as a place with traditional and spiritual meaning. The area is characterized by the presence of rock stacks (some exhibiting apparent antiquity as evidenced by the fusion of lichen on the rocks' surfaces), which hold religious significance to the tribes. The BLM's Klamath Falls Resource Area office has recommended that the area be nominated to the NRHP as an archaeological district, and possibly as a TCP. The Klamath Tribes expressed concern about both direct and indirect effects to the rock stack sites from pipeline construction, including the potential effects from blasting and vibration. Ruby noted that it has routed the pipeline to minimize disturbance to the rock stack piles, but the tribes would prefer that the entire area remain undisturbed. The Klamath Tribes also expressed concern about the Goose Lake area.

A January 27, 2009 meeting was held at the BLM Klamath Falls Resource Area office in order to discuss the significance of the rock stacks and the Antelope Creek area. The meeting was attended, either in person or via telephone, by the BLM, USFS, FERC, Reclamation, the Klamath Tribes, the Oregon SHPO, and Ruby along with its contractor EPG. Another meeting between the BLM, the Klamath Tribes, and Ruby regarding the same topic was held on April 1, 2009. Ruby is also coordinating an ethnography study of the Klamath Tribes and arranging for Klamath tribal monitors for future field surveys.

Ruby filed a letter with FERC on April 6, 2009, that committed to conducting additional field surveys to gather information necessary to consider route variations in Oregon. Ruby is also planning to use ground-penetrating radar as a discovery method for possible burials in the vicinity of Antelope Creek and Goose Lake, and is currently working with tribal representatives to plan and conduct such a survey. Ruby stated its intention to avoid or mitigate, to the Klamath Tribes' satisfaction, the culturally sensitive areas in the pipeline route. In consultation with the BLM and in discussion with Ruby, the Klamath Tribes have asserted that certain effects to archaeological sites may not be mitigated.

The Klamath Tribes have traditionally hunted mule deer as a subsistence animal and continue to do so. Migratory mule deer herds are known to follow corridors that could be disrupted by construction of the pipeline. The Klamath Tribes requested a seasonal construction schedule that would avoid the migratory corridor during the deer migration (as discussed in section 4.5.2).

The Eastern Shoshone Tribe expressed concern about project damage to sites that may be culturally sensitive to the Shoshone Nation. The Eastern Shoshone also requested a field visit to ensure that no pre-contact sites would be jeopardized by construction.

The Moapa Band of Paiutes indicated that the proposed project would not have any significant impact on them, but requested to be notified if items of interest were discovered.

The Te-Moak Western Shoshone Indians expressed their dissatisfaction with the government-to-government consultation conducted to date.

The California Native American Heritage Commission indicated that the project would not be covered by the California Environmental Quality Act and no approvals would be required.

4.10.3.2 Native American Comments on the Draft EIS

The comments we received during the draft EIS comment period from Native American groups or individuals reiterated some of the same concerns expressed earlier, and noted some new concerns. The most common concerns were:

- disappointment in government-to-government consultation;
- the fast pace of the environmental review;
- lack of information because surveys were not complete;
- tribal interest in the artifacts collected during surveys;
- natural geologic features and natural foods that have traditional and spiritual significance for the tribes;
- the creation of a new transmission corridor that would attract additional energy development within the corridor; and
- the use of Native American construction monitors.

Members of Native American tribes attended and spoke at the public meetings during the draft EIS comment period. At the July 21, 2009 meeting in Malin, Oregon, Mr. Lyonel Degarmo, a member of the Fort Bidwell Paiute Tribe, commented that the proposed pipeline route would go though his tribe's aboriginal land and might destroy sites historically connected to his tribe. Mr. Degarmo further stated that his aunt's grave is in the path of the pipeline. In a September 2009 filing Ruby committed to working with Mr. Degarmo and the Fort Bidwell Paiute Tribe to identify and avoid any impact on this burial.

Members of the Summit Lake Paiute Tribe attended meetings in Lakeview, Oregon and Winnemucca, Nevada. Mr. Ron Johnny, representing the Summit Lake Paiute Tribe, commented at the July 22, 2009 meeting in Lakeview, Oregon that the cultural resource surveys are not complete and stated that information from the surveys should be used to select a project route. At the same meeting, Mr. Reggie Townsend expressed concerns about irreparably impacting the water system at his reservation and affecting wildlife species such as the Lahontan cutthroat trout. Mr. Townsend also stated that important sites are present along the proposed route, including possible burial grounds. Mr. Townsend stated his preference for using Highway 140, which is already disturbed. Ms. Jerri Lynn Barlese spoke at the July 23, 2009 meeting in Winnemucca, Nevada. She commented that the draft EIS did not analyze the effects of the project on water resources and did not address the tribe's water rights. She also stated that the draft EIS did not analyze the effects of pipeline construction on the tribe's rights to use the land north of their reservation. She also asked if Ruby would train its employees to respect the cultural items that may be on the ground, because many of her ancestor's artifacts have been sold. Ms. Robin Burdette spoke at the Winnemucca, Nevada meeting. She emphasized the remote and undeveloped character of the proposed route just north of the tribe's reservation. She does not favor construction of the pipeline or any of the alternatives; she believes this area of northwestern Nevada should not be disturbed. She stated that once the area is impacted, it cannot be turned back. She stated that satellite imagery shows that this area of Nevada is one of the few places where there are no lights. Ms. Burdette also explained that tribal

members like her may not be familiar with commenting in public and it would be preferable if consultation could take place in tribal communities.

Ms. Justina Paradise, a member of the Council of the Fort McDermitt Paiute Shoshone Tribe, provided comments at the July 23, 2009 meeting in Winnemucca, Nevada. Ms. Paradise stated that the proposed route traverses the traditional territory traveled by Chief Winnemucca. She noted that she has information about the oral history of her tribe and knows the locations of some sacred sites.

Ms. Michon Eben of the Reno-Sparks Indian Colony spoke at the July 23, 2009 meeting in Winnemucca, Nevada. She stated that the project would impact Shoshoni and Paiute aboriginal territories. She doesn't believe that tribal concerns can be properly addressed at public meetings, and expressed her disappointment at the lack of government-to-government consultation. Ms. Eben expressed the Native American belief that cultural resources cannot be treated separately from other resources, and that her people attach spiritual meaning to all things. She believes that the EIS is incomplete without a review of the findings of the incomplete archaeological surveys. FERC responded to Ms. Eben at the meeting, stating that the surveys would be complete and the review of the surveys would run along a parallel track to the EIS. Ruby provided Ms. Eben with a copy of the Nevada cultural resources survey report for review.

Ms. Bernice Lalo of the Battle Mountain Western Shoshone tribe provided comments at the July 28, 2009 public meeting in Elko, Nevada. Ms. Lalo asked how FERC is dealing with artifacts and human bones. She would also like tribal monitors so that the tribes know what is happening on the ground during construction. She speaks for current and future Western Shoshone.

Mr. Steve Brady also spoke at the July 28, 2009 public meeting in Elko, Nevada. Mr. Brady did not provide his tribal affiliation, but he spoke on behalf of Native Americans. He stated that the draft EIS did not involve Indians and the BLM does not inform them of actions. He requested tribal monitors, and also requested information about what happens to the artifacts and where they would be stored. At the meeting, FERC responded that the Section 106 process parallels the NEPA EIS process and would address issues such as artifacts and human remains.

FERC also received several written comments on the draft EIS from Native Americans. Following issuance of the draft EIS, Mr. Warner Barlese, Chairman of the Summit Lake Paiute Tribe, filed a lengthy letter on July 21, 2009 that provided comments regarding his tribe's traditional and continued use of the proposed project area. According to Mr. Barlese, construction of the pipeline would prevent the Summit Lake Paiute Tribe from continuing their subsistence lifestyle, including collecting traditional resources and conducting spiritual ceremonies in the area immediately north of their reservation. Mr. Barlese wrote that the Summit Lake Paiute Tribe intends to extend the reservation boundaries to protect and manage their traditional resources. He requested that the project consider the tribe's efforts at environmental preservation and protection. Ruby responded that the Summit Lake Paiute Tribe has not provided them with sufficient information about specific resources that the tribe would like protected. Mr. Barlese also expressed concern regarding the pipeline's permanent 50-foot right-of-way. He stated that the right-of-way may affect the migration movements of antelope, bighorn sheep, and deer and further affect his tribe's rights to hunt them. Ruby has considered the effect of the pipeline on large game animals and their migration patterns; these issues are addressed in sections 4.5.1 and 4.5.2.

Mr. Barlese expressed several concerns about the impact of pipeline construction on the undeveloped and sparsely populated area around the tribe's reservation. These concerns center on the temporary construction work camps and use of access roads. Ruby has stated that it would not use access roads on the Summit Lake Paiute Tribe reservation. Some off-reservation access roads would be

improved to withstand construction traffic, but Ruby has committed to returning access roads to preconstruction condition as requested by the landowner. Mr. Barlese concurs with this action.

Several comments, including Mr. Barlese's, brought up the topic of mercury methylation. This naturally occurring toxin is found in certain rocks, and Ruby has identified a 1.5-mile segment of the pipeline route that has the potential to contain methyl mercury. Ruby would institute a testing and contamination containment plan for this segment of the pipeline (see section 4.1.2). Mr. Barlese also made several comments regarding possible contamination during the construction process. He noted that padding material used for filling the pipeline trench under certain circumstances should be free of contaminants. He also noted that water used for hydrostatic testing may contain pharmaceuticals such as endocrine disrupters; these should not be introduced to the Summit Lake Watershed, which supplies the tribe's fishery. Ruby would commit to programs designed to avoid contamination of the ground and water during construction (see section 4.2.3).

Mr. Barlese also commented on the possible impact on traditional Northern Paiute plants used for food and medicine. Ruby is aware of this issue and is working with a Northern Paiute tribal member to identify plants and seeds that would be appropriate for a seed bank or nursery which would assure accessibility to traditional plants during construction and reclamation. Ruby would need more information from the Summit Lake Paiute Tribe regarding the plants the tribe would like to bank in order to assist them with protecting culturally important plants. Ruby has agreed to develop grazing deferments and adopt other policies that would enhance revegetation efforts (see section 4.8.1.1), another concern expressed by Mr. Barlese.

One Mile Spring is the Summit Lake Paiute Tribe reservation's main source of drinking water. This spring is located 4,350 feet to the south of the pipeline route, and Mr. Barlese has made several comments expressing his concern that the spring would be impacted by blasting, vibration, or other construction activity. Ruby completed a geological study of potential project impacts on the spring, and although blasting and vibrations are expected to have no impact, Ruby would use trench plugs at the location to assure that the pipeline trench would not draw water away from the spring (see sections 4.2.1.1 and 4.3.1.3).

Mr. Barlese wrote that the tribe is in full agreement with the draft EIS condition for Environmental Inspection, and further supports the use of a joint third-party monitoring program.

Mr. Barlese expressed his preference for using existing right-of-way rather than constructing across greenfield. In this regard, he prefers selecting the Sheldon Route Alternative or the Black Rock Route Alternative instead of the proposed route. He also suggested that we consider the WWEC Corridor Route Alternative; however, Ruby has addressed this suggestion and noted that this corridor is non-contiguous and currently the subject of a lawsuit challenging its designation as an energy corridor. We have not recommended this route alternative. Mr. Barlese pointed out that there is a higher likelihood for higher-quality habitat for native species along the proposed route as compared to the two alternatives. He also suggested that increased activity along the sparsely populated proposed route would result in more animals killed by vehicle traffic.

Mr. Juan Laos of the Summit Lake Paiute Tribe submitted many of the same written comments as Mr. Barlese; the description of Mr. Barlese's comments above applies to Mr. Laos' as well. Mr. Laos stated that as a regular user of the land along the pipeline route, he is familiar with the practices of the Summit Lake Paiute Tribe and concerned that their ancestral lands would be destroyed.

Mr. Buck Sampson, who identifies himself as a Northern Paiute, filed the same comments on the draft EIS as Mr. Barlese. Mr. Sampson filed a subsequent letter that stated Indian monitors should be

with the survey crews, the land is his people's aboriginal territory, and tribal consultation has not been adequate.

Ms. Christina Gonzalez and Ms. Lorieta Cowan, members of the Summit Lake Paiute Tribe; Mr. Dean Barlese of the Pyramid Lake Paiute Tribe; Mr. Xzavier Barr and Mr. Jerry Barr, who identified themselves as Northern Paiute; Mr. Duane Masters of the Fort McDermitt Paiute-Shoshone Tribe; and Mr. Orville Barlese, who identified himself as a Northern Paiute Elder, all filed the same comments as those filed on July 21, 2009 by Mr. Barlese and described above. Descriptions and responses to his comments apply to the comments received from these Native American tribal members.

Mr. Robert Bear, Chairman of the Shoshone-Paiute Tribes of the Duck Valley Reservation, made several comments about the importance of the land to his people and the federal laws that address the tribe's legal rights. Chairman Bear noted that his tribe from eastern Nevada has not been consulted as much as tribes from the western side of the state. Among his comments about traditional or spiritual places, Chairman Bear noted that his tribe has used hot springs for healing and spiritual purposes since time immemorial. We have discussed Ruby's plans to mitigate impacts on geothermal resources such as hot springs in section 4.1.2.3. Mr. Bear also noted that the project may impact historic trails, such as the trail that Shoshone Mike traveled. In a September 14, 2009 filing, Ruby committed to consult with Mr. Bear about any project impacts on the tribe's historic trails. With regard to important sites and possible TCPs, Mr. Bear emphasized the confidential nature of such locations. He stated that tribal members would not disclose such information at public meetings, and they would not reveal this sensitive information to people unfamiliar to them. The ethnographic studies that are currently underway should identify the locations of traditional sites such as these so that potential project impacts on them would be addressed. Mr. Bear stated that his tribe is open to government-to-government consultation, but that FERC and BLM have not fulfilled their obligations in this regard. He further emphasized that federal agencies should not assume that consultation with some tribes extends to all tribes. Each tribe is a sovereign nation and requires separate consultation.

We received written comments from Mr. Stacy Dixon, Tribal Chairman of the Susanville Indian Rancheria in California. Mr. Dixon requested the presence of Native American tribal monitors during cultural resources surveys and ground disturbance during construction. He also requested face-to-face meetings between affected tribes and government agencies before surveys begin. Ruby has initiated a tribal monitor training program (see section 4.10.3, above), and the use of cultural resources monitors during construction is addressed in Ruby's Unanticipated Discovery Plans.

Mr. Aaron Townsend, Chairman of the Fort Bidwell Indian Community Council of California, expressed his dissatisfaction with the short review period and the rush to publish the EIS without completing the cultural resources studies. He stated that his main concerns were possible impacts on cultural sites, including ceremonial and burial sites, impacts on geological features such as springs, and impacts on roots and animals that are currently used by the tribes. These concerns would continue to be addressed through the Section 106 process, and should also be addressed by the ethnographic studies underway.

Mr. Joe Kennedy, the Tribal Chairperson for the Death Valley Timbisha Shoshone Tribe, submitted a letter that concurred with the need for the Ruby Pipeline Project, but expressed disappointment in the lack of government-to-government consultation conducted for the project.

We received a letter from Mr. Arlan D. Melendez, Chairman of the Tribal Council of the Reno-Sparks Indian Colony of Nevada. Mr. Melendez requested copies of the Unanticipated Discovery Plans, which are part of Ruby's POD, and the treatment plans that would be developed to address the mitigation of NRHP-eligible properties. Mr. Melendez would be provided with a copy of the treatment plans. Mr.

Melendez also wrote about the importance of incorporating natural resources with cultural resources, especially in the ethnographic studies. With regard to the Sheldon Route Alternative, Mr. Melendez cautioned that the concerns of a different social sector such as recreational sportsmen shouldn't trump the concerns of Native Americans, who depend on traditional resources along the proposed route. Mr. Melendez also expressed disappointment in the government-to-government consultation for the project, and concern about the short review period.

Mr. Melendez sent a letter to FERC dated October 23, 2009 that requested participation in the development and implementation of the Memoranda of Agreements (MOA). Mr. Melendez noted that Tribes have a unique understanding of the region's archaeological sites and artifacts and can contribute to the proper treatment of them. He also wants the Tribe's interests to be represented and respected.

In a letter dated October 3, 2009, Johnnie L. Bobb, the Chief of the Western Shoshone National Council, stated that the pipeline should use the West-wide corridor under military authority, and use of any other land was a trespass under the conditions of the Treaty of Ruby Valley of 1863. The Western Shoshone National Council is not a federally recognized Indian entity. The West-wide Energy Corridor is discussed in section 3.4.9.

We received several letters from Native Americans supporting the Ruby Pipeline Project, including Chairman Curtis R. Cesspooch of the Ute Indian Tribe of the Uintah and Ouray Reservation, Chairman Earnest House, Sr. of the Ute Mountain Ute Tribe, and Chairman Matthew J. Box of the Southern Ute Indian Tribe. These tribes produce and distribute energy from their tribal lands, and promote Native American energy production and better access to energy markets on the West Coast. We also received a letter of support for the project from A. David Lester, Executive Director of the Council of Energy Resource Tribes.

In a letter dated November 5, 2009, the Summit Lake Paiute Tribe's Chairman, Warner Barlese expressed concern over the sufficiency of the final EIS, requested an extension of time for completion of the final EIS and tribal consultation, and indicated that all information deficiencies and outstanding studies be completed and included in the FEIS. Mr. Barlese also voiced the tribe's desire to participate in the drafting of endangered species mitigation plans. In addition, Mr. Barlese indicated that the tribe "has repeatedly declared the area along the proposed route in the narrow strip of land between the Summit Lake Reservation and the Sheldon NWR as a TCP, but this declaration has yet to be acknowledged by FERC or the BLM." We note that a TCP was not identified in any of Mr. Barlese's numerous previous correspondences, during our October 28, 2008 meeting (summarized above), nor in the tribe's own study (see above). However, if the tribe has new information it now is willing to share, we would consider this during the Section 106 process.

Although not a member of a Native American tribe, Ms. Sheri Eklund-Brown, Chairman of the Elko County Commission provided comments at the July 28, 2009 public meeting in Elko, Nevada that expressed her support of the project and the positive economic impact, but requested that the tribal concerns be addressed. She noted that she and other parties support the tribes in protecting some sacred Native American locations.

4.10.4 Non-Jurisdictional Electric Power Lines

As part of this final EIS, FERC is including an environmental review of two distribution line projects that would contribute to the operation of the pipeline compressor stations, but do not come under the same jurisdiction as the pipeline project. A 1.5-mile power line would be constructed by Rocky Mountain Power from their transmission grid to Ruby's Roberson Creek Compressor Station in Lincoln

County, Wyoming. A 3.5-mile power line would be constructed by Harney Electric Cooperative from their transmission grid to Ruby's Desert Valley Compressor Station in Humboldt County, Nevada.

In Environmental Resource Reports on the Rocky Mountain Power power line in Wyoming and the Desert Valley power line in Nevada filed with FERC on October 14, 2009, and December 2, 2009, respectively, Ruby reported that information about the cultural resources of the lines would be provided in separate reports. To date, Ruby has not provided these cultural resource reports. Depending on the jurisdiction over the distribution line projects, federal and state agencies, as well as other interested parties, would consult on the project, and Ruby would comply with the applicable laws and regulations.

4.10.5 Compliance with the National Historic Preservation Act

Project reporting, as well as some field studies remain to be completed. Historic properties treatment plans that would address mitigation of those NRHP-eligible sites that cannot be avoided must be completed. In addition, report reviews and tribal consultations are still ongoing. Consequently, the FERC, BLM, FWS, USFS, COE, and Reclamation have not completed the process of complying with Section 106 of the NHPA. The FERC, in consultation with the SHPOs, BLM, and other consulting/appropriate parties (such as other federal agencies, tribes, or state agencies), would determine NRHP-eligibility of properties and also determine whether construction of the project would affect any historic properties when all surveys, evaluations, and studies have been completed and comments have been addressed. Ruby would develop treatment plans for historic properties that could not be avoided. These plans would be submitted for review and approval by appropriate parties, including the relevant SHPOs and land managing agencies. These treatment plans also would address treatment related to any Native American TCPs and areas with traditional religious or cultural significance. The ACHP has indicated that it would participate in consultation. Once treatment plans are approved, MOA would be executed for each state requiring resolution of adverse effects. Ruby would implement treatment measures only after MOAs are executed and Ruby receives the required project authorizations from the FERC and BLM.

To ensure that the FERC's, BLM's, FWS', USFS', COE's, and Reclamation's responsibilities under the NHPA and its implementing regulations are met, **we recommend that Ruby not begin construction of facilities, including the pipeline, compressor stations, and meter stations; and/or use of all staging, storage, or temporary work areas, and new or to-be-improved access roads until:**

- **a. Ruby addresses any comments on the cultural resources survey reports, addendum reports, and supplemental studies;**
- **b. Ruby files with the Secretary:**
  - **(1) any required revised reports/studies and the BLM's, USFS's, Reclamation's, COE's, FWS's, SHPOs', and any Native American tribes' (as appropriate) comments on the revised reports/studies;**
  - **(2) any additional required cultural resource survey and evaluation reports, and avoidance and mitigation/treatment plans, and addresses any other information that the SHPOs, BLM, USFS, Reclamation, COE, or FWS request; and**
  - **(3) the SHPOs', BLM's, USFS's, Reclamation's, COE's, FWS's, other appropriate state agencies', and any Native American tribe's (as appropriate) comments on the reports and plans;**
- **c. the ACHP has commented on the project; and**

d. the FERC staff reviews and the Director of OEP approves the cultural resource reports and plans, and notifies Ruby in writing that treatment plans/mitigation measures (including archaeological data recovery) may be implemented and/or construction may proceed.

All material filed with the Commission that contains location, character, and ownership information about cultural resources must have the cover and any relevant pages therein clearly labeled in bold lettering "CONTAINS PRIVILEDGED INFORMATION – DO NOT RELEASE."

4.11 AIR QUALITY & NOISE

4.11.1 Air Quality

Air quality would be affected by construction and operation of the proposed project. Although air emissions would be generated by operation of equipment during construction of the pipeline and aboveground facilities proposed by Ruby, the majority of the air emissions associated with the project would result from the operation of the proposed compressor stations. We received comments during scoping regarding the project's impacts on air quality during construction and operation. Those comments are addressed in this section.

The Ruby Pipeline Project consists of approximately 675.2 miles of new natural gas pipeline which would extend over portions of Wyoming, Utah, Nevada, and Oregon. Construction activities are currently anticipated to commence as early as spring 2010 and would take approximately 10 to 13 months to complete. In addition, new compressor stations would be constructed in Wyoming Utah, and two in Nevada. Table 4.11.1-1 provides an overview of the emission-generating equipment proposed for each compressor station. Proposed emissions equipment for the Vya Construction Camp is identified in Section 9.1 of Appendix P and includes, among other things one 2,000 kW diesel electrical generator, three 1,000 kW diesel electrical generators, 42 propane water heaters, and 70 propane furnaces. Ruby's Lakeview Temporary Housing Facility would utilize existing municipal electric, water, and sewer services. No emissions equipment is proposed for the Lakeview facility.

TABLE 4.11.1-1

Proposed Compressor Stations for the Ruby Pipeline Project

Compressor Station	County, State	Proposed Equipment	ISO-rated hp[a]	Fuel Type
Roberson Creek	Lincoln County, WY	3 Motor-Driven Compressors	69,000	Electric
		1 Emergency Generator		Natural Gas
		Auxiliary Heaters		Natural Gas
Wildcat Hills	Box Elder County, UT	2 Turbine-Powered Compressors	28,668	Natural Gas
		1 Emergency Generator		Natural Gas
		Auxiliary Heaters		Natural Gas
Wieland Flat	Elko County, NV	2 Turbine-Powered Compressors	39,662	Natural Gas
		1 Emergency Generator		Natural Gas
		Auxiliary Heaters		Natural Gas
Desert Valley	Humboldt County, NV	1 Turbine-Powered Compressor	19,831	Natural Gas
		1 Emergency Generator		Natural Gas

	Auxiliary Heaters	Natural Gas

a ISO-rated horsepower is a standard measure and not representative of site conditions.

The compressors at the Roberson Creek Compressor Station would be driven by electric motors, and the station would be equipped with a natural gas-fired emergency generator and natural gas-fired auxiliary heaters. This station would have short-term construction-related air quality emissions from the station installation and long-term emissions from operation of the generators and heaters. The remaining three stations are planned with natural gas-fired turbines and auxiliary equipment that would result in long-term operational impacts on air quality. Emissions from construction equipment would also contribute to air quality impacts. Our analysis focuses primarily on the nature and extent of the long-term operational impacts because the air quality impacts associated with station construction would be temporary (*i.e.*, less than 1 year) and intermittent (*i.e.*, not operated continuously).

Each of the compressor stations would be required to comply with federal, state, and local air quality permitting requirements that are driven by the CAA and its amendments.[7] The CAA authorizes the EPA to establish National Ambient Air Quality Standards (NAAQS) to protect public health and public welfare and to regulate emissions of hazardous air pollutants (HAPs). The WDEQ indicated that air quality modeling would not be required for the permit application for the Roberson Creek Compressor Station. Because of the use of the electric engines at the station, we agree that air quality modeling is not necessary and thus is not included in table 4.11.1-9.

Air quality modeling analyses would be required for the remaining three compressor stations. Ruby filed a Notice of Intent (NOI) and related air quality impact analyses with the Utah Department of Environmental Quality–Division of Air Quality (UDAQ) to construct the Wildcat Hills Compressor Station. UDAQ issued Approval Order Number DAQE-AN0142090001-09 for the Wildcat Hills Compressor Station on August 12, 2009. Ruby also filed Class I permit applications and submitted air quality impact analyses to the Nevada Division of Environmental Protection (NDEP) for the Wieland Flat and Desert Valley compressor stations. NDEP issued Class I Air Operating Permit to Construct AP4922-2537 for the Wieland Flat Compressor Station on September 11, 2009.

Emissions from the set-up, operation, and decommissioning of the Vya Construction Camp would be temporary. The camp would be required to comply with federal, state, and local air quality regulations. Air quality modeling would not be required for the camp.

4.11.1.1 Existing Air Quality

The climate in the vicinity of the pipeline and compressor stations is varied and is characterized by data collected at five meteorological monitor locations (see table 4.11.1-2). There is generally a large variation between the diurnal high and low temperatures due to the elevation and the proximity of mountains near all five monitoring locations. Winds are generally light for all five locations. Precipitation is light during the summer and fall and is heavier during the winter and spring.

Ambient air quality is regulated by federal, state, and local agencies. The NAAQS were developed to protect the public health and welfare from any known or anticipated adverse effects of a pollutant (examples of welfare include wildlife, buildings, national monuments, vegetation, visibility, and property values). The EPA has established NAAQS for seven criteria pollutants: carbon monoxide (CO); lead (Pb); nitrogen dioxide (NO_2); ozone (O_3); particulate matter with an aerodynamic diameter less than

[7] The CAA, 42 USC 7401 et seq. as amended in 1977 and 1990, is the basic federal statute governing air pollution.

or equal to 10 micrometers (μm) (PM_{10}); particulate matter with an aerodynamic diameter less than or equal to 2.5 μm ($PM_{2.5}$); and SO_2.

TABLE 4.11.1-2

Representative Annual Average Weather Conditions for the Ruby Pipeline Project Area[a]

Meteorological Monitor Location	Maximum Temperature[b] (°F)	Minimum Temperature[b] (°F)	Precipitation[b] (inches)	Snowfall[c] (inches)	Wind Speed[d] (mph)	Wind Direction
Lander, WY	58.0	31.9	13.42	104.0	7.0	WSW
Salt Lake City, UT	62.9	41.2	16.5	61.0	9.0	SSE
Elko, NV	62.2	30.6	9.6	36.6	6.0	SW
Winnemucca, NV	65.6	33.0	8.3	22.7	8.0	S
Vya, NV[d]	58.2	29.1	14.8	26.5	---	---

a National Oceanic and Atmospheric Administration, 2009.
b Maximum and minimum temperatures, precipitation, and snowfall based on data from 1971 to 2000. Precipitation amounts are liquid equivalents (*i.e.,* amounts include rainfall as measured, and snowfall as a liquid equivalent [how much rain it would equal when the snow is melted]).
c Snowfall based on data from 1959 to 1980.
d Wind speed based on data from 1930-1996.

State ambient air quality standards (AAQS) have been adopted for most of these criteria pollutants in Nevada, Wyoming, and Oregon. Wyoming also has standards for hydrogen sulfide (H_2S), suspended sulfates, and fluorides. Utah has not adopted state-specific AAQS, but has adopted the NAAQS for criteria pollutants. Federal and state AAQS are summarized in table 4.11.1-3.

HAPs are pollutants that are known or suspected to cause acute or long-term serious health effects such as cancer, reproductive effects or birth defects, or adverse environmental impacts. The EPA lists a total of 187 HAPS under the CAA. Examples of toxic air pollutants include benzene, which is found in gasoline; perchlorethlyene, which is emitted from some dry cleaning facilities; and methylene chloride, which is used as a solvent and paint stripper by a number of industries. The primary HAP of concern for natural gas compressor facilities is formaldehyde. AAQS, in general, have not been established for these pollutants. However, federal, state, and local regulations such as the National Emission Standards for Hazardous Air Pollutants (NESHAP) have been established to reduce their release to the atmosphere.

GHGs occur in the atmosphere both naturally and as a result of human activities, such as the burning of fossil fuels. These gases are the integral components of the atmosphere's greenhouse effect that warms the earth's surface and moderates day/night temperature variation. The most abundant GHGs are water vapor, CO_2, methane (CH_4), nitrous oxide (N_2O), and O_3. The primary GHGs emitted from the construction and operation of natural gas transmission pipelines are CO_2, CH_4, and N_2O. Emissions of GHGs are typically expressed in terms of CO_2 equivalents (CO_2e), where the potential of each gas to increase heating in the atmosphere is expressed as a multiple of the heating potential of CO_2, or its global warming potential (GWP). The potential for this project to contribute to climate change impacts is discussed in section 4.13.11.

TABLE 4.11.1-3

Federal and State Ambient Air Quality Standards for the Ruby Pipeline Project

Pollutant	Averaging Period	NAAQS	Nevada Air Quality Standards	Wyoming Air Quality Standards	Utah Air Quality Standards[a]	Oregon Air Quality Standards
CO	8-Hour	9 ppm[b] (10 μg/m^3)	9 ppm[b,i] 6 ppm[b,j]	Same as NAAQS	Same as NAAQS	Same as NAAQS
	1-Hour	35 ppm[b] (40 μg/m^3)	Same as NAAQS	Same as NAAQS	Same as NAAQS	Same as NAAQS
Pb	Rolling 3-month[v]	0.15 μg/m^3	Same as NAAQS	Same as NAAQS	Same as NAAQS	Same as NAAQS
NO_2	Annual	0.053 ppm (100 μg/m^3)	Same as NAAQS	0.05 ppm (100 μg/m^3)	Same as NAAQS	Same as NAAQS
O_3	8-Hour	0.075 ppm[c](0.08 ppm)[d]	-	0.08 ppm[c]	Same as NAAQS	0.08 ppm[p]
	1-Hour	0.12 ppm[e]	0.12 ppm[k] 0.10 ppm[k,l]	-	Same as NAAQS	-
PM_{10}	Annual	-	50 μg/m^3	50 μg/m^3	Same as NAAQS	50 μg/m^3
	24-Hour	150 μg/m^3[f]	150 μg/m^3[m]	150 μg/m^3[n]	Same as NAAQS	150 μg/m^3[q]
$PM_{2.5}$	Annual	15 μg/m^3[g]	-	Same as NAAQS	Same as NAAQS	-
	24-Hour	35 μg/m^3[h]	-	65 μg/m^3[o]	Same as NAAQS	-
SO_2	Annual	0.03 ppm (80 μg/m^3)	Same as NAAQS	0.02 ppm (60 μg/m^3)	Same as NAAQS	0.02 ppm (60 μg/m^3)
	24-Hour	0.14 ppm[b] (365 μg/m^3)	Same as NAAQS	0.10 ppm[b] (260 μg/m^3)	Same as NAAQS	0.10 ppm[b] (260 μg/m^3)
	3-Hour	0.5 ppm[b] (1,300 μg/m^3)	Same as NAAQS	Same as NAAQS	Same as NAAQS	Same as NAAQS
H_2S	½ Hour	-	-	70 μg/m^3[r] 40 μg/m^3[s]	-	-
Suspended Sulfates	Annual	-	-	0.25 mg/ 100 cm^2/day	-	-
	30-Day	-	-	0.50 mg/ 100 cm^2/day	-	-
Fluorides (ambient air standards)	30 Days	-	-	0.4 μg/m^3[t]	-	-
	7 Days	-	-	0.5 μg/m^3[t]	-	-
	24 Hours	-	-	1.8 μg/m^3[t]	-	-
	12 Hours	-	-	3.0 μg/m^3[t]	-	-
Fluorides (in forage for animal consumption)	1 Year	-	-	30 ppm[u]	-	-
	60 Days	-	-	60 ppm[u]	-	-
	30 Days	-	-	80 ppm[u]	-	-

a Utah has not adopted specific state AAQS, but has adopted the NAAQS for criteria pollutants.

b Not to be exceeded more than once per year.

c The 2008 standard. The 3-year average of the 4th highest daily maximum 8-hour average concentration over each year must not exceed the standard.

d The 1997 standard, and the implementation rules for this standard, will remain in place for implementation purposes as EPA undertakes rulemaking to address the transition from the 1997 ozone standard to the 2008 ozone standard.

e As of June 15, 2005, this standard was revoked in all areas except the 14 8-hour ozone early-action compact areas.

f Not to be exceeded more than once per year on average over 3 years.

g The 3-year average of the weighted annual mean concentrations must not exceed the standard.

h The 3-year average of the 98th-percentile concentrations must not exceed this standard.

i Applicable to elevations less than 5,000 feet.

j Applicable to elevations at or greater than 5,000 feet.

TABLE 4.11.1-3 (cont.)

Federal and State Ambient Air Quality Standards for the Ruby Pipeline Project

Pollutant	Averaging Period	NAAQS	Nevada Air Quality Standards	Wyoming Air Quality Standards	Utah Air Quality Standards [a]	Oregon Air Quality Standards

k	The 1-hour ozone standard is attained when the expected number of days per calendar year with a maximum hourly average concentration above the standard is equal to or less than one.
l	Applicable to Lake Tahoe Basin monitoring station 90 only.
m	The standard is attained when the expected number of days per calendar year with a 24-hour average concentration above the standard, rounded to the nearest 10 µg/m3, is equal to or less than 1. The expected number of days per calendar year is generally based on an average of the number of times the standard has been exceeded per year for the last 3 years.
n	Not to be exceeded more than once per year.
o	98th-percentile concentration.
p	Standard is attained when the average annual 4th-highest 8-hour average concentration is equal or less to the standard.
q	Standard is attained when the expected number of days per calendar year with a 24-hour average concentration above the standard is less than or equal to 1.
r	Standard not to be exceeded more than two times per year.
s	Standard not to be exceeded more than two times in any 5 consecutive days.
t	Measured as hydrogen fluoride.
u	Measured as fluorine.
v	Standard is 3-month rolling average, effective January 12, 2009.
ppm	parts per million
µg/m3	micrograms per cubic meter
mg	milligram

Air Quality Control Regions and Attainment Status

Air Quality Control Regions (AQCRs) were established in accordance with Section 107 of the CAA as a means to implement the CAA and to comply with the NAAQS through State Implementation Plans. The AQCRs are intrastate and interstate regions such as large metropolitan areas where the improvement of the air quality in one portion of the AQCR requires emission reductions throughout the AQCR. Each AQCR, or portion thereof, is designated as attainment (areas in compliance with the NAAQS), unclassifiable, maintenance, or nonattainment (areas not in compliance with the NAAQS). Areas where the ambient air pollutant concentration is determined to be less than the applicable ambient air quality standard are designated attainment. Areas where no data are available are designated unclassifiable. Unclassifiable areas are treated as attainment areas for the purpose of permitting a stationary source of pollution. Areas where the ambient air concentration is greater than the applicable ambient air quality standard are designated nonattainment. Areas that have been designated nonattainment but have since demonstrated compliance with ambient air quality standard(s) are designated maintenance for that pollutant.

All four of the proposed compressor stations and the Vya Construction Camp would be located in areas designated by the EPA as attainment or unclassifiable for the seven regulated criteria pollutants.

Air Quality Monitoring

A network of ambient air quality monitoring stations has been established by the EPA and state and local agencies to measure and track background concentrations of criteria pollutants across the United States. Data from existing air quality monitoring stations were obtained to characterize the background air quality in the regions surrounding the compressor station sites. Given the remote location of the project, few ambient monitoring stations are located in proximity to the proposed project activities. Table 4.11.1-4 provides air pollutant measurements from ambient air monitoring stations in the general project

area. These measurements are from urban, residential, or agricultural areas that may not be representative of the entire project area.

TABLE 4.11.1-4

Ambient Air Quality Measurements for the Ruby Pipeline Project Area

Pollutant	Averaging Time	Ambient Air Quality Measurements[a]			
		Murphy Ridge, WY ID 560410101	Brigham City, UT ID 490030003	North Portage, UT ID 490037001	Elko, NV ID 320070004
CO	8-Hour	1.5 ppm (2007)	-	-	-
	1-Hour	1.6 ppm (2007)	-	-	-
Pb[b]	Quarterly	-	-	-	-
NO_2	Annual	0.003 μg/m^3 (2007)	-	-	-
O_3	1-Hour	0.081 ppm (2007)	0.117 ppm (2005)	0.091 ppm (2007)	-
	8-Hour	0.070 ppm[c] (2007)	0.078 ppm[d] (2005-2007)	0.076 ppm[d] (2005-2007)	-
PM_{10}	Annual	12 μg/m^3 (2007)	-	-	26 μg/m^3 (2007)
	24-Hour	157 μg/m^3 (2008)	-	-	163 μg/m^3 (2003)
$PM_{2.5}$	Annual	-	10.11 μg/m^3 (2004)	5.36 μg/m^3 (2005)	-
	24-Hour	-	52 μg/m^3[c] (2004)	37.6 μg/m^3[c] (2004)	-
SO_2	Annual	0.001 μg/m^3 (2007)	-	-	-
	24-Hour	0.006 μg/m^3 (2007)	-	-	-
	3-Hour	0.007 μg/m^3 (2007)	-	-	-

a EPA, 2007b. Except where noted, the maximum values measured over the period from 2003 through 2008 are listed. These measurements are from urban, residential, or agricultural areas that may not be representative of the areas in which the Ruby Pipeline Project compressor stations and other activities would be located.
b Pb is not measured at any of the ambient air monitoring stations in the project area.
c Value is 4th-highest value measured for the year listed.
d Value is the 3-year average of the 4th-highest value measured for each year listed.

Representative ambient air quality background measurements for the compressor station sites were provided by the WDEQ, UDAQ, and NDEP. These background concentrations are summarized in table 4.11.1-5. The state agencies indicated that some of these measurements are based on data from urban areas or industrial sites and may represent higher values than those found in the rural areas where the compressor stations would be located.

4.11.1.2 Air Quality Regulatory Requirements

Federal Regulations

The Ruby Pipeline Project would generate air emissions through both short-term construction activities (including at the Vya Construction Camp) and long-term operation of the compressor stations. Three of the four proposed compressor stations would emit air pollutants as a result of natural gas combustion that powers compressors, emergency generators, and auxiliary heaters. The electric-driven Roberson Creek Compressor Station would emit air pollutants generated by the natural gas-powered emergency generator and auxiliary heaters. Each of the compressor stations would be subject to federal, state, and local air quality regulations that are driven by the CAA and its amendments. The provisions of the CAA that are potentially relevant to this project are listed below and are discussed in the following subsections:

- Nonattainment New Source Review (NNSR) / Prevention of Significant Deterioration (PSD);
- Federal Class I Area Protection;
- New Source Performance Standards (NSPS);
- NESHAP;
- Title V Operating Permits;
- General Conformity; and
- GHG Reporting Rule.

TABLE 4.11.1-5

Ambient Air Quality Background Concentrations for Compressor Stations Sites for the Ruby Pipeline Project

Pollutant	Averaging Period	Roberson Creek Compressor Station[a]	Wildcat Hills Compressor Station[b]	Wieland Flat Compressor Station[c]	Desert Valley Compressor Station[c]
CO	8-Hour	-	1 ppm	[e]	[e]
	1-Hour	-	1 ppm	[e]	[e]
Lead	Quarterly	-	-	[e]	[e]
NO_2	Annual	3.4 μg/m^3	10 μg/m^3	[e]	[e]
O_3	1-Hour	-	-	[e]	[e]
	8-Hour	-	-	[e]	[e]
PM_{10}	Annual	6.2 μg/m^3	10 μg/m^3	9 μg/m^3	9 μg/m^3
	24-Hour	17.7 μg/m^3	34 μg/m^3	10.2 μg/m^3	10.2 μg/m^3
$PM_{2.5}$	Annual	-	[d]	[e]	[e]
	24-Hour	-	[d]	[e]	[e]
SO_2	Annual	5 μg/m^3	5 μg/m^3	[e]	[e]
	24-Hour	18 μg/m^3	10 μg/m^3	[e]	[e]
	3-Hour	29 μg/m^3	20 μg/m^3	[e]	[e]

a Sharp, 2008.
b Prey, 2008. Except for annual PM_{10}, all values are based on estimates for rural areas. Annual PM_{10} value is based on monitoring at the ATK Solid Rocket Test Facility (Promontory, Utah).
c NDEP, 2008. Values are based on monitoring data from Lehman Caves (Baker, Nevada) in the Great Basin National Park.
d Background $PM_{2.5}$ values have not been established by the UDAQ. Background PM_{10} values were used as a surrogate for $PM_{2.5}$.
e Background values have not been established by the NDEP for non-PSD emission sources in attainment areas.

Nonattainment New Source Review/Prevention of Significant Deterioration

NNSR is required for major emission sources that would be located or expanded in a nonattainment area, while PSD review is required for major emission sources located or expanded in an area designated as attainment. None of the proposed compressor stations or the Vya Construction Camp would be located in a nonattainment area; therefore, NNSR would not apply.

The PSD regulations, as codified in 40 CFR 52.21, define a major source or major modification as:

- a source with a potential-to-emit of more than 100 tons per year (tpy) of any regulated criteria pollutant for a facility that is one of the 28 industrial source categories listed in 40 CFR 52.21 (b)(1)(i)(a);

- a source with a potential-to-emit of more than 250 tpy of any regulated criteria pollutant for a facility that is not one of the 28 industrial source categories listed in 40 CFR 52.21 (b)(1)(i)(a);
- a modification to an existing major source that results in a net emissions increase of a regulated criteria pollutant greater than the PSD significant emission rate specified in 40 CFR 52.21 (b)(23)(i) or in state/local regulations (where state/local regulations are governing); or
- an existing minor source proposing a modification that is major by itself.

The PSD process evaluates existing ambient air quality, the potential impacts of the proposed source on ambient air quality and whether the source would contribute to a violation of the NAAQS, and a review of Best Available Control Technology (BACT). PSD limits the amount of ambient air deterioration that would be allowed in an attainment area by a proposed source. As part of PSD, the air quality deterioration within federal Class I areas (*i.e.*, federally protected wilderness areas and national parks) is also limited. Natural gas compressor stations are not identified in the list of 28 source categories in the CAA; therefore, the applicability threshold for PSD review for the proposed compressor stations would be 250 tpy for each pollutant.

Based on the emissions data available for each proposed compressor station (presented in table 4.11.1-6), the estimated potential emissions for each pollutant would be below the 250-tpy threshold; therefore, the compressor stations would be considered minor sources and none would trigger PSD review. Ruby has stated the emissions from the Vya Construction Camp would not exceed the 250-tpy threshold; therefore, PSD review would not be required. Ruby would acquire air permits from the Washoe County Air Quality Management Division for operation of the Vya camp as necessary.

TABLE 4.11.1-6

Estimated Operational Emission Rates for Compressor Stations for the Ruby Pipeline Project

Compressor Station	Proposed Source[a]	CO		NO_x		PM_{10}		$PM_{2.5}$		SO_2		Volatile Organic Carbons (VOC)		Formaldehyde		Total HAPs	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Roberson Creek	Stand-by Generator[b]	2.4	0.6	1.2	0.3	<0.1	0.007	<0.1	0.007	<0.1	0.0004	0.6	0.2	0.1	0.04	0.2	0.05
	Heaters[c]	<0.1	0.2	<0.1	0.3	<0.1	0.02	<0.1	0.02	<0.1	0.002	<0.1	0.01	<0.1	0.0002	<0.1	0.005
	Total	**2.4**	**0.8**	**1.2**	**0.6**	**<0.1**	**0.03**	**<0.1**	**0.03**	**<0.1**	**0.002**	**0.6**	**0.2**	**0.1**	**0.04**	**0.2**	**0.05**
Wildcat Hills	Solar Mars 100[d]	6.6	28.7	6.5	28.3	3.5	15.5	3.5	15.5	0.4	1.8	0.8	3.3	0.3	1.2	0.3	1.4
	Solar Mars 100[d]	6.6	28.7	6.5	28.3	3.5	15.5	3.5	15.5	0.4	1.8	0.8	3.3	0.3	1.2	0.3	1.4
	Stand-by Generator[b]	5.9	1.5	3.0	0.7	<0.1	0.02	<0.1	0.02	<0.1	0.001	1.5	0.4	0.4	0.09	0.5	0.1
	Heaters[c]	<0.1	0.2	<0.1	0.3	<0.1	0.02	<0.1	0.02	<0.1	0.002	<0.1	0.01	<0.1	0.0002	<0.1	0.005
	Total	**19.1**	**59.0**	**16.0**	**58.0**	**7.0**	**31.0**	**7.0**	**31.0**	**0.8**	**3.5**	**3.0**	**7.0**	**0.9**	**2.6**	**1.1**	**2.9**
Wieland Flat	Solar Titan 130[d]	15.4	67.6	12.7	55.5	4.2	18.3	4.2	18.3	0.5	2.1	0.9	3.9	0.3	1.5	0.4	1.7
	Solar Titan 130[d]	15.4	67.6	12.7	55.5	4.2	18.3	4.2	18.3	0.5	2.1	0.9	3.9	0.3	1.5	0.4	1.7
	Stand-by Generator[b]	5.9	1.5	3.0	0.7	<0.1	0.02	<0.1	0.02	<0.1	0.001	1.5	0.4	0.4	0.09	0.5	0.1
	Heaters[c]	<0.1	0.2	<0.1	0.3	<0.1	0.02	<0.1	0.02	<0.1	0.002	<0.1	0.01	<0.1	0.0002	<0.1	0.005
	Total	**36.8**	**137.0**	**28.4**	**112.0**	**8.4**	**37.0**	**8.4**	**37.0**	**1.0**	**4.1**	**3.3**	**8.2**	**1.0**	**3.0**	**1.2**	**3.4**
Desert Valley	Solar Titan 130[d]	16.4	72.0	13.5	59.1	4.4	19.4	4.4	19.4	0.5	2.2	0.9	4.1	0.4	1.6	0.4	1.8
	Stand-by Generator[b]	5.9	1.5	3.0	0.7	<0.1	0.02	<0.1	0.02	<0.1	0.001	1.5	0.4	0.4	0.09	0.5	0.1
	Heaters[c]	<0.1	0.2	<0.1	0.3	<0.1	0.02	<0.1	0.02	<0.1	0.002	<0.1	0.01	<0.1	0.0002	<0.1	0.005
	Total	**22.4**	**74.0**	**16.5**	**60.0**	**4.5**	**19.0**	**4.5**	**19.0**	**0.5**	**2.2**	**2.4**	**4.5**	**0.7**	**1.7**	**0.9**	**1.9**

a Only natural gas-fired sources are listed because electric-motor driven sources would not impact air quality.
b NO_x, CO, and VOC emission factors obtained from NSPS Subpart JJJJ for spark-ignition emergency generators. Emission factors for PM_{10}, $PM_{2.5}$, SO_2, and formaldehyde were obtained from AP-42 Section 3.2 (4-stroke lean burn engines).
c Emission factors obtained from AP-42 Section 1.4 (Natural Gas Combustion).
d NO_x, CO, and VOC emission rates are based on the Emission Performance Data Sheet for Solar Turbines Titan 130-20502S and 100-15000S. PM_{10} and $PM_{2.5}$ emission factors are based on Solar Turbines' Product Information Letter 171 "Particulate Matter Emission Estimates." Emission factors for SO_2 were obtained from AP-42 Section 3.1. Emission factors for formaldehyde and total HAPs are based on Solar Turbines' Product Information Letter 168 "Volatile Organic Compound, Sulfur Dioxide, and Formaldehyde Emission Estimates."
lb/hr pounds per hour

Federal Class I Area Protection

In 1977, the U.S. Congress designated certain lands (*e.g.*, national parks or wilderness areas) as mandatory federal Class I areas because the air quality was considered a special feature of the given area. These federal Class I areas, and any other areas that have been redesignated as federal Class I areas since 1977, are given special protection under the PSD program. The PSD program established air pollution increment increases that are allowed by new or modified air pollution sources. If the new source is required to comply with PSD program requirements and is near a federal Class I area (within 100 kilometers), the source is required to determine its impacts at the nearby federal Class I area(s). The source is also required to notify the appropriate federal land managing agencies for the nearby federal Class I area(s). The nearest Class I areas to the proposed compressor station sites and the Vya Construction Camp are listed below:

- The Roberson Creek Compressor Station would be approximately 84 miles (135 kilometers) southwest of the Bridger Wilderness Area.
- The Wildcat Hills Compressor Station would be approximately 103 miles (165 kilometers) east of the Jarbidge Wilderness Area.
- The Wieland Flat Compressor Station would be approximately 31 miles (50 kilometers) southwest of the Jarbidge Wilderness Area.
- The Desert Valley Compressor Station would be approximately 68 miles (110 kilometers) east of the South Warner Wilderness Area.
- The Vya Construction Camp would be approximately 16 miles (26 kilometers) northeast of the South Warner Wilderness Area.

Because the proposed compressor stations and Vya camp are minor sources and not subject to PSD requirements, a Class I Visibility Impact analysis is not required under PSD.

New Source Performance Standards

Section 111 of the CAA requires EPA to identify categories of new and modified sources that contribute significantly to air pollution and endanger public health or welfare. After identifying approximately 60 source categories (*e.g.*, fossil fuel-fired turbines, steam generating units, combustion engines) that are designated by size as well as type of process, the EPA established uniform, national emission standards known as NSPS in 40 CFR 60.

The objective of NSPS is to promote use of the best demonstrated control technologies, taking into account the cost of such technology and any other non-air quality, health, and environmental impact, as well as energy requirements. The Ruby Pipeline Project would involve the installation of natural gas-fired turbines that are subject to Subpart KKKK: Standards of Performance for Stationary Combustion Turbines. Pursuant to these regulations, each turbine would be required to meet emission limits for NO_x and SO_2. The project also would involve installation of stand-by generator engines that are subject to Subpart JJJJ: Standards of Performance for Stationary Spark Ignition Internal Combustion Engines. Pursuant to these regulations, the emergency generators would be required to meet emission limits for NO_x, CO, and Volatile Organic Carbons (VOC).

National Emission Standards for Hazardous Air Pollutants

The NESHAP is codified in 40 CFR 61 and 40 CFR 63 to regulate the emissions of HAPs. The CAA established a list of 189 HAPs and technical criteria for establishing HAP emission limits for certain industries. The proposed turbines could be subject to 40 CFR 63 Subpart YYYY that requires Maximum Achievable Control Technology (MACT) to reduce emissions of HAPs through the installation of control equipment if they were located at a major source for HAP pollutants. The compressor stations and the Vya Construction Camp are not expected to be major sources and therefore would not be subject to Subpart YYYY.

The natural gas-driven emergency generators would be subject to the reciprocating internal combustion engine MACT standard published in 40 CFR 63 Subpart ZZZZ if the station rating is greater than 500 hp and the station's potential HAP emissions exceed 10 tpy of an individual HAP or 25 tpy of HAPs collectively (*i.e.*, major source of HAPs). All three of the natural gas-fired compressor stations with reciprocating internal combustion engines would have a station rating greater than 500 hp; however, as shown in table 4.11.1-6, the total potential HAP emissions for these compressor stations are expected to be below the major source thresholds, so Subpart ZZZZ would not apply.

Title V Operating Permits

Title V of the CAA Amendments of 1990 requires a federal operating permit for major sources of criteria pollutants and requires states to establish an air operating permit program. The requirements for Title V are outlined in 40 CFR 70, and the permits required by these regulations are often referred to as Part 70 permits. The criteria for the Title V Program are as follows:

- emissions of any criteria pollutant greater than 100 tpy; or
- HAP emissions greater than 10 tpy of any individual HAP or greater than 25 tpy of all HAPs.

Because the projected CO and NO_x emissions for the Wieland Flat Compressor Station would be greater than 100 tpy (see table 4.11.1-6), this station would be considered a Part 70 major source and would require a Title V Operating Permit to operate. Thus, the Wieland Flat Compressor Station would need a Class I operating permit issued by the NDEP. The other three compressor stations have potential emissions that are less than the Title V Program criteria. Therefore, Title V Operating Permits would not be needed for these stations.

General Conformity

The EPA promulgated the General Conformity Rule in 1993 to implement the conformity provision of Title I, Section 176(c)(1) of the CAA (40 CFR 51.853). Section 176(c)(1) requires that the federal government not engage, support, or provide financial assistance for licensing or permitting, or approve any activity not conforming to an approved CAA implementation plan.

The General Conformity Rule is codified in 40 CFR 51, Subpart W; and 93, Subpart B, Determining Conformity of General Federal Actions to State or Federal Implementation Plans. A federal action is subject to the General Conformity Rule if it is not classified as an exempt activity and if:

- the total direct emissions of a nonattainment/maintenance pollutant (or its precursors) equal or exceed *de minimis* emission thresholds established in the General Conformity regulations; or

- the emissions equal or exceed 10 percent of the total emissions budget for the entire nonattainment or maintenance area.

If emissions are less than these criteria levels, then the federal action is presumed to conform with the State Implementation Plan, and the General Conformity Rule is not applicable.

Section 176(c)(1) of the CAA states that a federal agency cannot approve or support any activity that does not conform to an approved State Implementation Plan. Conforming activities or actions should not, through additional air pollutant emissions:

- cause or contribute to new violations of the NAAQS in any area;
- increase the frequency or severity of any existing violation of any NAAQS; or
- delay timely attainment of any NAAQS or interim emission reductions.

The emissions from the construction and operation of the Ruby Pipeline Project would not occur in nonattainment areas; therefore, the General Conformity Rule is not applicable.

Greenhouse Gas Reporting Rule

On September 22, 2009, the EPA issued the final Mandatory Reporting of Greenhouse Gases Rule. It requires reporting of GHG emissions from suppliers of fossil fuels and facilities that emit greater than or equal to 25,000 metric tons[9] of GHG (as carbon dioxide equivalent emissions) per year. The combustion-related GHG carbon dioxide equivalent emissions from operation of Ruby's natural gas-fired compressor stations (Wildcat Hills, Wieland Flat, and Desert Valley) could potentially exceed 25,000 metric tons per year. Ruby would be required to comply with all applicable requirements of EPA's rule for all actual GHG emissions from proposed sources at the stations equal to or greater than 25,000 metric tons per year.

State Regulations

In addition to the federal regulations described above, Wyoming, Utah, and Nevada have state air quality regulations that would apply to the project. There would be no short- or long-term emissions sources constructed in Oregon. Ruby's Lakeview Temporary Housing Facility in Oregon would utilize existing municipal electric, water, and sewer services

Wyoming

Requirements for air permits are codified under the Wyoming Air Quality Standards and Regulations, Chapter 6. An application for a permit to construct the Roberson Creek Compressor Station was submitted to the WDEQ on February 18, 2009. The following regulations include state-specific emission requirements that would apply to the natural gas-fueled heaters and stand-by generators planned for the Roberson Creek Compressor Station:

- Wyoming Air Quality Standards and Regulations Chapter 3, Section 2. *Emission Standards for Particulate Matter*. Visible emissions of any contaminants discharged into the atmosphere from any single new emission source shall be limited to 20 percent opacity.

[9] 1 metric ton is equal to 2,205 pounds, or approximately 1.1 tons.

- Wyoming Air Quality Standards and Regulations Chapter 6, Section 2. *Permit Requirements for Construction, Modification, and Operation*. A proposed facility will utilize BACT with consideration of the technical practicability and economic reasonableness of reducing or eliminating the emissions resulting from the facility.

Utah

Utah air quality is regulated by the Utah Administrative Code, Title R307. An Approval Order from the UDAQ would be necessary prior to construction of the Wildcat Hills Compression Station. Before issuing an Approval Order, the UDAQ is required to review and assess an NOI submitted for a proposed facility. An NOI to construct the station was submitted to the UDAQ on February 16, 2009. UDAQ issued Approval Order Number DAQE-AN0142090001-09 for the Wildcat Hills Compressor Station on August 12, 2009. The following regulation includes state-specific emission requirements that would apply to the natural gas-fueled turbines and stand-by generators planned for the Wildcat Hills Compressor Station:

- Utah Administrative Code R307-401-5. *Permit: New and Modified Sources - Notice of Int*ent. New emission sources are required to consider BACT. Control may be achieved by means of good process design, sound operating practices, emission control devices, or a combination of these means.

Therefore, Ruby prepared a BACT analysis as part of its NOI for the Wildcat Hills Compressor Station. In accordance with UDAQ guidance, the following criteria are used when analyzing strategies to achieve BACT: energy impacts, environmental impacts, economic impacts, other considerations, and cost calculations.

Nevada

Nevada air emissions are codified under Nevada Administrative Code, Chapter 445B. These requirements would pertain to the Wieland Flat and Desert Valley Compressor Stations. The proposed emission sources at the Desert Valley Compressor Station would be below Title V thresholds. Therefore, this compressor station would be considered a minor source, and a Class II permit would need to be obtained from the NDEP. Permit-to-construct applications for the Wieland Flat and Desert Valley compressor stations were prepared accordingly and submitted to the NDEP in February 2009. NDEP issued Class I Air Operating Permit to Construct AP4922-2537 for the Wieland Flat Compressor Station on September 11, 2009. The following regulations include state-specific emission requirements that apply to the natural gas-fueled turbines and stand-by generators planned for the compressor stations:

- Nevada Administrative Code 445B.22017. *Visible Emissions: Maximum Opacity; Determination and Monitoring of Opacity*. No owner or operator may cause or permit the discharge of emissions from any emission unit that has opacity equal to or greater than 20 percent.

- Nevada Administrative Code 445B.2203. *Emissions of Particulate Matter: Fuel-Burning Equipment*. The allowable emissions of PM_{10} caused by the combustion of fuel in fuel combustion equipment must be calculated by the following formulas:

    - For maximum heat input equal to or greater than 4 million Btu/hour but less than or equal to 10 million Btu/hour, the allowable emission is 0.6 pound per million Btu of heat input.

- For maximum heat input greater than 10 million Btu/hour but less than 4,000 million Btu/hour, the allowable emissions are calculated using the following equation: $Y = 1.02X^{-0.231}$; where "X" means the maximum operating rate (in million Btu/hour) and "Y" means the allowable rate of emission (in pounds/million Btu).

- Nevada Administrative Code 445B.22047. *Sulfur emissions: Fuel-burning equipment*. The allowable emission of compounds of sulfur caused by the combustion of fuel in fuel-burning equipment with a maximum heat input of less than 250 million Btu/hour must be calculated by use of the following equation: $Y = 0.7X$; where "X" means the maximum operating heat input (in million Btu/hour) and "Y" means the allowable rate of emission of sulfur (in lb/hr).

4.11.1.3 Construction Impacts on Air Quality

Air quality impacts from the construction phase of the project would result primarily from construction equipment and fugitive dust emissions. Construction equipment and other mobile sources would be powered by diesel or gasoline fuels and would have intermittent and short-term (generally limited to the construction period) emissions of CO, SO_2, NO_x, $PM_{10}/PM_{2.5}$, and VOCs. Emissions from gasoline and diesel engines would be built to comply with the EPA mobile source regulations (40 CFR 85). Air emissions from the electrical generators at the Vya Construction Camp would be mitigated through the use of a selective catalytic reduction system to reduce NO_x emissions. Because the construction equipment would only be operated on an as-needed basis, the emissions resulting from the operation of construction equipment would be further minimized.

We received comments during the scoping period regarding the potential of the project to generate nuisance fugitive dust during construction. Ruby would employ standard construction practices to control the generation of fugitive dust emissions during construction. State and local air quality agencies administer regulations that can require monitoring and/or control measures to minimize the generation of fugitive dust. A summary of the air quality fugitive dust regulatory requirements applicable to project construction activities is presented in Table 4.11.1-7. The NDEP and Washoe County (Nevada) Air Quality Management Division are the only jurisdictions that require specific plans and/or permits for large-scale construction projects. Ruby has submitted an application for a surface area disturbance permit/fugitive dust control plan for project construction activities in Elko and Humboldt counties to the NDEP. Ruby would be required to prepare and submit an application for a dust control permit for project construction activities in Washoe County to the Washoe County Air Quality Management Division.

TABLE 4.11.1-7

Applicable Fugitive Dust Regulations for the Ruby Pipeline Project

Air Quality Agency	Rule Number and Title	Rule Description
Washoe County Air Quality Management Division	40.030 (Dust Control)	The purpose of this rule is to limit particulate material emissions into the ambient air from any property, operations, or activities that may serve as a fugitive dust source.
NDEP	NAC 445B.22037 (Emissions of Particulate Matter: Fugitive Dust)	Requirements for fugitive dust control and requirements for dust control plans and permits.

Ruby has created a Fugitive Dust Control Plan (Appendix O) that identifies potential dust emission sources and requires control measures for the generation of fugitive dust during construction. The following construction activities have been identified as having the potential for generating fugitive dust:

- vehicle and motorized equipment on paved and unpaved access roads;
- vegetation removal;
- clearing and grading;
- topsoil removal;
- cutting and filling;
- trenching;
- backfilling;
- blasting;
- track-out onto roads;
- bulk material loading, hauling, and unloading;
- use of material storage piles; and
- use of parking, staging, and storage areas.

The generation of fugitive dust during construction activities would be reduced through the application of appropriate control measures. The Fugitive Dust Control Plan outlines several specific control measures to be used as needed to control project-related fugitive dust emissions. These control measures are based on typical practices for natural gas pipeline construction and the requirements of the aforementioned agencies. The following control measures would be implemented as part of the Fugitive Dust Control Plan:

- apply water one or more times per day to all actively used unpaved roads and unpaved haul and access roads;
- reduce vehicle speeds on all unpaved roads, and unpaved haul and access roads. Speed limits may be set for travel on unpaved roads; and
- apply water to active construction areas as needed. Areas should be pre-watered and soils maintained in stabilized condition where support equipment and vehicles would operate. Disturbed soils would be watered to form a crust.

In their September filing, Ruby committed to update the Fugitive Dust Control Plan to revise language for haul trucks. Ruby agreed to cover haul truck loads carrying sand, gravel, solid trash, or other loose material. Ruby also would be required to obtain landowner or land managing agency approval and appropriate local permits prior to any open burning activities.

Air emissions as a result of pipeline construction are typically intermittent and short-term, as projects typically move through an area relatively quickly. Emissions from fugitive dust and construction activities would be controlled to the extent required by state and local agencies. Typically, the greatest concern for construction emissions occurs at stationary sites where heavy construction equipment would operate for an extended period of time, such as at compressor stations. Based on our experience with similar projects, we would expect compressor station construction to result in air emissions within the following ranges:

Air Pollutant	Expected Emissions Range
$PM_{2.5}$	2 to 40 tpy
PM_{10}	10 to 30 tpy
NO_x	8 to 40 tpy
CO	5 to 25 tpy
SO_2	1 to 5 tpy
VOC	1 to 5 tpy

We believe that the project would incorporate sufficient measures to ensure that appropriate levels of air quality are maintained during construction, and that Ruby would comply with the appropriate state regulations concerning the mitigation of fugitive dust emissions. If all the fugitive dust mitigation measures are implemented by Ruby, we conclude that emissions from construction-related activities would not significantly affect local or regional air quality.

4.11.1.4 Operational Impacts on Air Quality

Operational emissions would result primarily from natural gas-fired turbines, emergency generators, and auxiliary heaters located at the compressor stations. These compressor stations would be used to compress natural gas for transportation through the pipeline. Combustion emissions from these stations would mainly consist of NO_x, CO, HAPs, VOCs, SO_2, and $PM_{10}/PM_{2.5}$ (see table 4.11.1-6). As stated in section 4.11.1.2, none of the proposed compressor stations would have potential emissions in quantities large enough to trigger a PSD review. Therefore, the compressor stations would be minor sources relative to the PSD permitting process and would only require state construction and operating air permits.

GHGs, which include CO_2, CH_4, and N_2O, would also be produced from combustion sources at the compressor stations. CH_4 can be released from blowdown events under routine operations or upset conditions (*i.e.*, pipeline venting, compressor station venting, meter station venting, or pigging and inspection). In addition, CH_4 emissions can occur due to leaks from pipeline and system components such as equipment packing, seals, valves, flanges, pneumatic devices, and connectors. GHG emission estimates for pipeline and compressor station operation are presented in table 4.11.1-8. Ruby and its shippers have agreed to construct and operate the Ruby Pipeline Project as a carbon-neutral pipeline, which would be achieved through various methods such as design and operation considerations, the use of offsets, restoration, *etc*.

TABLE 4.11.1-8

Annual GHG Emissions Estimates from Pipeline and Compressor Station Operation for the Ruby Pipeline Project

GHG Emission Category	Emission Source	GHG Emissions (metric tons CO_2e/year)
Stationary Combustion	Compressors, Stand-By-Generators, Heaters	258,174
Fugitive	Pipeline	98
Fugitive	Meter Station Components	242
Fugitive	Compressor Station Components	5,168
Fugitive	Compressor Components	35,737
Fugitive	Station Blowdown	8,550
Fugitive	Pipeline Blowdown	11,230
	Total	**319,200**

Ruby would be required to comply with all applicable federal, state, and local air quality regulations. Compliance with these regulations would minimize the air quality impacts of compressor station operation. The respective state air quality permitting process for each compressor station would dictate the level of mitigation that may be required for the potential emissions from each station. Following the permitting process, emissions compliance testing would be required to ensure that the compressor stations are operating within their federal, state, and local permit conditions.

The Wieland Flat Compressor Station has a potential to emit greater than 100 tpy of NO_x and CO, and therefore would be considered a Title V major source. Ruby would be required to obtain the necessary air quality permits for construction prior to building the compressor station, but the Title V Operating Permit could be obtained after operations have commenced.

Ruby modeled future air emissions in accordance with guidance from the appropriate state air permitting agencies, and demonstrated that the operation of the compressor stations would not cause nor contribute to a violation of the NAAQS or any state AAQS. Given the projected low level of emissions for the Roberson Creek Compressor Station, air dispersion modeling was not required by the WDEQ.

The UDAQ required that potential NO_2, PM_{10}, and formaldehyde emissions be modeled for the Wildcat Hills Compressor Station. The NDEP required that potential CO, NO_2, PM_{10}, SO_2, and O_3 emissions be modeled for the Wieland Flat and Desert Valley compressor stations. Since O_3 is not directly emitted from emission sources, the ozone emissions were modeled using a screening technique developed by the EPA and summarized in *VOC/NO_x Point Source Screening Tables* (Scheffe, 1988). The results of this modeling, as presented in Table 4.11.1-9, indicate that the compressor stations would not violate the NAAQS or any state AAQS.

Air quality impacts would be mitigated through the use of natural gas-fired turbines and generators that are compliant with NSPS Subpart KKKK and NSPS Subpart JJJJ at all compressor stations. In addition, BACT would be applied to the turbines and stand-by generators operated at the Wildcat Hills Compressor Station.

Operation of the proposed project would be expected to result in long-term minor impacts on air quality from the proposed compressor stations and other aboveground facilities; however, significant impacts are not anticipated to occur. Periodic use of access roads during operations would result in infrequent and minor impacts associated with dust, and these impacts would be localized and temporary when they did occur.

4.11.2 Noise

Noise levels can be affected both during construction and operation of pipeline projects. The magnitude and frequency of environmental noise may vary considerably over the course of the day, throughout the week, and across seasons, in part due to changing weather conditions and the effects of seasonal vegetative cover. Two measures to relate the time-varying quality of environmental noise to its known effect to people are the 24-hour equivalent sound level (L_{eq}) and day-night sound level (L_{dn}). The L_{eq} is the level of steady sound with the same total (equivalent) energy as the time-varying sound of interest, averaged over a 24-hour period. The L_{dn} is the L_{eq} plus 10 decibels on the A-weighted scale (dBA) added to account for people's greater sensitivity to nighttime sound levels (between the hours of 10 p.m. and 7 a.m.). The A-weighted scale is used because human hearing is less sensitive to low and high frequencies than mid-range frequencies. The human ear's threshold of perception for noise change is considered to be 3 dBA; 6 dBA is clearly noticeable to the human ear, and 10 dBA is perceived as a doubling of noise.

TABLE 4.11.1-9

Dispersion Modeling Results for the Ruby Pipeline Project

Pollutant	Averaging Period	Wildcat Hills Compressor Station[a]		Wieland Flat Compressor Station[b]		Desert Valley Compressor Station[b]	
		Total Concentration[c] ($\mu g/m^3$)	Utah AAQS or TSL ($\mu g/m^3$)	Total Concentration[c] ($\mu g/m^3$)	Nevada AAQS ($\mu g/m^3$)	Total Concentration[c] ($\mu g/m^3$)	Nevada AAQS ($\mu g/m^3$)
CO	8-Hour	-	-	88.0	10,000	117	10,000
	1-Hour	-	-	303.0	40,000	242	40,000
NO_2	Annual	11.5	100	1.1	100	1.1	100
PM_{10}[d]	Annual	10.8	50	9.3	50	9.1	50
	24-Hour	51.2	150	16.6	150	13.8	150
SO_2	Annual	-	-	0.032	80	0.016	80
	24-Hour	-	-	0.7	365	0.4	365
	3-Hour	-	-	2.2	1,300	1.1	1,300
O_3	8-Hour	-	-	0.011 ppm	0.075 ppm	0.011 ppm	0.075 ppm
	1-Hour	-	-	0.011 ppm	0.12 ppm	0.011 ppm	0.12 ppm
Formaldehyde	1-Hour	15.0	37	-	-	-	-

a NO_2, PM_{10}, and formaldehyde would be emitted at levels greater than UDAQ thresholds for modeling. Therefore, NO_2 and PM_{10} were the only criteria pollutants, and formaldehyde the only HAP, included in the air quality impact analysis. Model used: EPA's Industrial Source Complex model (ISC3).

b O_3 impacts were modeled using a screening technique developed by the EPA and summarized in *VOC/NO_x Point Source Screening Tables* (Scheffe, 1988). Model used for CO, NO_2, PM_{10}, and SO_2: EPA's AERMOD, Version 070206.

c Total concentration is the sum of the maximum modeled concentration and the background concentration.

d The impact analysis for PM_{10} is used as a surrogate for the impact analysis of $PM_{2.5}$.

e Pb would not be anticipated to be emitted from station equipment; and therefore, is not included in the impact analysis.

f An impact analysis was not performed for the Roberson Creek Compressor Station given the projected low level of emissions. The WDEQ would determine the need for an air quality analysis after reviewing the submitted permit-to-construct application.

TSL Toxic Screening Level

Noise impacts related to a natural gas pipeline project generally fall into two categories: temporary impacts resulting from operation of construction equipment and long-term or permanent impacts resulting from operation of compressor units. Construction-related noise from heavy equipment would be of a similar nature regardless of the project. We received comments during the public scoping comment period regarding the project's noise levels during construction and operations, and those comments are addressed in this section's discussion.

The ambient sound level of a region is defined by the total noise generated within the specific environment, and is usually comprised of sound emanating from natural and artificial sources. At any location, both the magnitude and frequency of environmental noise may vary considerably over the course of the day and throughout the week. This variation is caused in part by changing weather conditions and the effects of seasonal vegetation cover.

4.11.2.1 Noise Regulatory Requirements

In 1974, the EPA published its *Information on Levels of Environmental Noise Requisite to Protect Public Health and Welfare with an Adequate Margin of Safety*. This document provides information for state and local governments to use in developing their own ambient noise standards. EPA has determined that an L_{dn} of 55 dBA protects the public from indoor and outdoor activity noise interference.

The FERC has adopted this criterion to screen for new compressor stations and associated pipeline facilities (18 CFR 380.12), and it is used here to evaluate the potential noise impact from operation of the project. An L_{dn} of 55 dBA is equivalent to a continuous noise level of 48.6 dBA for facilities that operate at a constant level of noise. Our guidelines also require that new pipeline facilities not result in a perceptible increase in vibration at any noise-sensitive area (NSA). In addition, a sound level of 55 dBA (L_{dn}) can be used as a "benchmark noise criterion" for assessing the noise impact of temporary or intermittent noise.

Based on a review of the state regulations, no applicable noise regulations were identified for natural gas compressor station facilities constructed and operated in Wyoming, Utah, or Nevada.

4.11.2.2 Existing Noise Environment

Noise impacts are determined at NSAs including residences, schools, daycare facilities, hospitals, long-term care facilities, places of worship, libraries, and parks and recreational areas specifically valued for their solitude and tranquility, such as wilderness areas. Each compressor station has been evaluated for adjacent NSAs and surrounding ambient noise levels.

Ruby identified existing NSAs in the vicinity of each of the proposed compressor station sites. Ruby also conducted daytime ambient noise monitoring at each closest NSA to determine daytime sound levels (L_d); nighttime sound levels (L_n) were assumed to be equal to L_d. Ruby used this information to calculate a day-night sound level (L_{dn}) for each compressor station. The NSAs, their distance and direction from each site, and the measured or estimated noise levels are summarized in table 4.11.2-1. The nearest NSA to the Vya Construction Camp is the Old Yella Dog Ranch located about 6,000 feet southeast of the camp.

TABLE 4.11.2-1

NSA Locations and Measured/Estimated Ambient Noise Levels in the Vicinity of the Compressor Stations for the Ruby Pipeline Project[a]

Compressor Station	Distance/Direction of Nearest NSA	L_d (dBA)	L_n[b] (dBA)	L_{dn} (dBA)
Roberson Creek	25,900 feet / NNW	25.0	25.0	31.6
Wildcat Hills	7,500 feet / NNW	28.0	28.0	34.4
Wieland Flat	33,800 feet / SSW	37.0	37.0	43.4
Desert Valley	23,800 feet / W	24.0	24.0	30.4

a Acoustical analysis was performed by Hoover & Keith Inc., 2008.
b L_n was not measured; it was assumed to be equal to L_d.

The Roberson Creek Compressor Station would be in a rural area of Lincoln County, Wyoming. The nearest NSA is a residence approximately 25,900 feet (4.9 miles) north-northwest of the proposed station site. Ruby measured ambient sound on September 18, 2008. Noise sources at the NSA included

the sound of birds and insects and occasionally the noise of distant aircraft. Daytime sound levels at the NSA were measured at 25.0 dBA with a calculated L_{dn} of 31.6 dBA.

The Wildcat Hills Compressor Station would be in a rural area of Box Elder County, Utah. The nearest NSA is a residence located approximately 7,500 feet (1.4 miles) north-northwest of the station site. Ruby measured ambient sound on September 17, 2008. Noise sources at the NSA included the sound of birds and insects, the noise of distant aircraft, and occasionally wind-related noise (*i.e.*, wind blowing in the grass/foliage). Daytime sound levels at the NSA were measured at 28.0 dBA with a calculated L_{dn} of 34.4 dBA.

The Wieland Flat Compressor Station would be located in a rural area of Elko County, Nevada. The nearest NSA is a residence approximately 33,800 feet (6.4 miles) south-southwest of the station site. Ruby measured ambient sound on September 24, 2008. Noise sources at the NSA included wind-related noise (*i.e.*, wind blowing in the grass/foliage), the noise of distant vehicles along Highway 225, the sound of birds/insects, and occasionally the sound of distant dog-barking. Daytime sound levels at the NSA were measured at 37.0 dBA with a calculated L_{dn} of 43.4 dBA.

The Desert Valley Compressor Station would be in a rural area of Humboldt County, Nevada, approximately 43 miles northwest of Winnemucca. The nearest NSA is a residence approximately 23,800 feet (4.5 miles) south-southwest of the station site. Ruby measured ambient sound on September 25, 2008. Noise sources at the NSA included wind-related noise (*i.e.*, wind blowing in the grass/foliage), the noise of distant vehicles along Highway 140, the sound of birds/insects, and occasionally, the sound of distant dog-barking. Daytime sound levels at the NSA were measured at 24.0 dBA with a calculated L_{dn} of 30.4 dBA.

4.11.2.3 Construction Noise

Construction of the pipeline would cause temporary increases in ambient noise levels in the immediate vicinity of the construction sites. On-site construction noise would result mainly from heavy-duty construction equipment (*e.g.*, trucks, backhoes, excavators, loaders, and cranes). Typical pipeline construction equipment (both mobile and stationary) and corresponding noise emission levels are presented in table 4.11.2-2. The estimated "worst-case" noise level for the construction of the pipeline, excluding any HDDs, would be 85 dBA at 50 feet. The worst-case noise level is derived by assuming that all of the construction equipment listed in table 4.11.2-2 is operating simultaneously and by combining sound pressure levels logarithmically. It is highly unlikely that all of the equipment would operate simultaneously. Noise from on-site construction activities that may occur near a NSA along the pipeline route could be intermittent or continuous but would be limited to short durations over a period of 3 to 4 weeks at any one location.

Construction of the compressor stations would involve clearing and grading; placement of fill; and excavation for foundations for the compressor unit packages, other equipment settings, ancillary equipment, station piping, and associated unit housing and other structures. Ruby anticipates that construction of the compressor stations would commence as early as mid-May 2010 for completion in March 2011. Table 4.11.2-3 presents typical noise emission levels at 50 feet for the noise-producing equipment that would be used during the construction of the compressor stations. Because of the distance to the nearest NSA for each compressor station site, the noise resulting from construction activities should be significantly lower than 55 dBA (L_{dn}).

TABLE 4.11.2-2

Construction Noise from Typical Pipeline Construction Equipment Activities

Equipment	Reference dBA at 50 feet	Number of Devices	Usage (percent)[b]	Estimated Noise Level (dBA) at the Specified Distance from the Source (feet)					
				50	100	250	500	1,000	2,500
3-Ton Truck	84	1	40	80	74	66	60	54	46
Dump Truck	84	1	40	80	74	66	60	54	46
Concrete Truck	85	1	40	81	75	67	61	55	47
Fuel Truck	84	1	40	80	74	66	60	54	46
Backhoe	80	1	40	76	70	62	56	50	42
Trenching Machine	85	1	40	81	75	67	61	55	47
Crane	85	1	16	77	71	63	57	51	43
Front End Loader	80	1	40	76	70	62	56	50	42
Bulldozer	85	1	40	81	75	67	61	55	47
Sideboom	85	1	16	77	71	63	57	51	43
Boring Machine	85	1	20	78	72	64	58	52	44
Padding Machine	85	1	40	81	75	67	61	55	47
Farm Tractor	84	1	40	80	74	66	60	54	46
Mulching Machine	86	1	40	82	76	68	62	56	48
Air Compressor	80	1	40	76	70	62	56	50	42
Generator/Light Plant	82	1	50	79	73	65	59	53	45
Water Pump	77	1	50	74	68	60	54	48	40
Water Truck	84	1	40	80	74	66	60	54	46
Welding Machine	73	1	40	69	63	55	49	43	35
Welding Truck	55	1	40	51	45	37	31	25	17
X-Ray Truck	55	1	40	51	45	37	31	25	17
Total Worst-Case Result[a]				**92**	**86**	**78**	**72**	**66**	**58**

a Derived by adding the individual equipment noise levels logarithmically using the following formula: L_{eq}total = $10\log(\Sigma(10L_{eq}/10))$.

b DOT, 2006.

Ruby has committed to implementing the following measures during construction of the pipeline and compressor stations:

- where possible, perform construction primarily during daytime hours when there is less sensitivity to sound. However, water pumping operations and hydrostatic testing of the pipeline would likely occur on a 24-hour basis;
- ensure that all equipment has sound control devices no less effective than those provided by the manufacturer. No equipment would have unmuffled exhausts; and
- to the extent feasible, configure the construction site in a manner that keeps noisier equipment and activities as far as possible from NSAs.

Construction of the Vya Construction Camp also would cause temporary increases in noise levels in the immediate vicinity of the construction site. Construction noise levels would be expected to range from 70 to 80 dBA at 50 feet and would last for a period of about 10 weeks. At the nearest NSA, 6,000 feet away, an 80-dBA construction noise level would be reduced to 38 dBA due to geometric spreading of sound energy.

Sound sources associated with the operation of the Vya Construction Camp would include four diesel generators and 70 small furnaces operating for a period of about 8 to 10 months. Because of the

distance to the nearest NSA, the noise resulting from the operation of the camp should not have a noise impact at the NSA. No long-term impacts on the existing noise environment would occur as the Vya camp would only actively operate for 8 to 10 months (not including setup or decommissioning).

TABLE 4.11.2-3

Construction Noise from Typical Compressor Station Construction Equipment Activities

Construction Activity	Equipment	Noise Level at 50 Feet (dBA)
Land Clearing & Grading	Backhoe	85
	Bulldozer	80
	Chainsaw	81
	Truck	88
	Maximum Sound Level	91
Compressor Station Construction	Truck	88
	Forklift	83
	Backhoe	85
	Cement Truck	85
	Maximum Sound Level	92

4.11.2.4 Operational Noise

Ruby performed noise analyses to estimate noise levels that would be attributable to compressor station operation. These levels were evaluated against the existing baseline L_{dn} noise levels and our impact criterion to determine potential impacts at the nearby NSAs. The calculated noise levels for each compressor station, as well as the existing ambient sound level and future sound level for the nearest NSAs, are presented in table 4.11.2-4. The analyses for most of the sites indicated that noise level increases would be less than 3 dBA. Industry standards consider increases of 3 dBA or less to be imperceptible to the human ear, 6 dBA to be distinctly noticeable and 10 dBA to be approximately a doubling of noise.

TABLE 4.11.2-4

Operational Noise Level Summaries at NSAs for the Ruby Pipeline Project

Compressor Station	NSA Description	Ambient L_{dn} (dBA)	Estimated Station L_{dn} (dBA)	Estimated Total[a] L_{dn} (dBA)	Potential Noise Increase (dBA)
Roberson Creek	Residence	31.6	19.6	31.9	0.3
Wildcat Hills	Residence	34.4	36.6	38.6	4.2
Wieland Flat	Residence	43.4	19.3	43.4	0.0
Desert Valley	Residence	30.4	21.7	30.9	0.5

a L_{dn} of compressor station plus ambient noise.

As shown in table 4.11.2-1, the distance from the compressor stations to the NSAs are considerable. Operational noise from the four compressor stations is estimated at values well below the maximum L_{dn} value of 55 dBA that is required under the FERC guidelines for operational compressor station noise at the nearest NSAs. Because of the extreme distance to NSAs at the Roberson Creek, Wieland Flat, and Desert Valley compressor stations, little to no impacts at the NSAs are expected. However, the Wildcat Hills Compressor Station has an NSA approximately 7,500 feet away, which is close enough that the potential noise increase of 4.2 dBA could be noticeable, and an impact greater than 55 dBA L_{dn} is possible, depending on local conditions (*e.g.*, climate, topography). To ensure that noise impact at the nearest NSA to the Wildcat Hills Compressor Station is not significant, **we recommend that Ruby make all reasonable efforts to ensure its predicted noise level from the Wildcat Hills**

Compressor Station is not exceeded at the nearest NSA. Ruby should file noise surveys <u>no later than 60 days</u> after placing this compressor station in service. If the noise attributable to the operation of all of the equipment at the Wildcat Hills Compressor Station at full load exceeds an L_{dn} of 55 dBA at any nearby NSAs, Ruby should install additional noise controls to meet the level <u>within 1 year</u> of the in-service date. Ruby should confirm compliance with the above requirement by filing a second noise survey <u>no later than 60 days</u> after it installs the additional noise controls.

A sound level analysis was also performed for unit blowdown events. Two types of gas blowdown events could occur at each station: (1) a maintenance gas blowdown that can occur when a compressor is stopped, and gas between the suction/discharge valves and compressors is vented to the atmosphere via a blowdown stack, and (2) an emergency shutdown that would only occur at required DOT test intervals or in an emergency situation. The unit blowdown event would occur infrequently and only for a short time frame (*e.g.*, 1 to 5 minutes). Table 4.11.2-5 presents Ruby's projected sound levels for a blowdown event at the nearest NSA for each compressor station.

TABLE 4.11.2-5

Projected Sound Levels for a Blowdown Event at the Nearest NSA for the Ruby Pipeline Project[a]

Compressor Station	Distance to Nearest NSA (feet)	Peak Sound Level (dBA)	L_{dn} (dBA)
Roberson Creek	25,900	16	23
Wildcat Hills	7,500	47	54
Wieland Flat	33,800	14	21
Desert Valley	23,800	22	29

The L_{dn} for unit blowdown events is below our 55 dBA criterion. In addition, due to the distance between the closest NSAs and the proposed compressor station sites, the noise resulting from a unit blowdown event would be short-lived and would not have a significant impact on the surrounding environment.

Operational noise impacts at the compressor stations would be lessened by installing the compressor engines within insulated building structures and by the use of attenuation equipment such as exhaust and intake silencers. The use of attenuation equipment and the normal attenuation of sound with distance generally ensures that noise levels are controlled.

The proposed compressor station locations are in relatively remote areas currently devoid of residential or industrial activity and, as can be seen in table 4.11.2-1, are very quiet. Thus, the large increase in operational noise within the immediate vicinity of the compressor stations represents a change to the ambient environment and has the potential to disturb or otherwise impact wildlife. We discuss project-related noise impacts on wildlife in general and on the greater sage-grouse in particular, in sections 4.5.1.3 and 4.7.3.1, respectively.

4.11.3 Non-Jurisdictional Electric Power Lines

Neither the Rocky Mountain Power nor Harney Electric Cooperative electric transmission or distribution lines would involve the construction or modification air emission sources or substantial noise-generating facilities. There would be no long-term air quality or impacts associated with construction of the lines. Air quality impacts from the construction phase of the lines would be similar to pipeline construction and would result primarily from combustion and fugitive dust emissions associated with construction equipment. Noise impacts also would be similar and would occur mainly from heavy-duty construction equipment (*e.g.*, trucks, backhoes, excavators, loaders, and cranes).

4.12 RELIABILITY AND SAFETY

The transportation of natural gas by pipeline involves some risk to the public in the event of an accident and subsequent release of gas. The greatest hazard is a fire or explosion following a major pipeline rupture.

CH_4, the primary component of natural gas, is colorless, odorless, and tasteless. Methane is not toxic and is classified as a simple asphyxiate that possesses a slight inhalation hazard. Respiration of high concentrations of CH_4 can lead to oxygen deficiency and serious injury or death. CH_4 has an auto-ignition temperature of about 1,000 °F and is flammable at concentrations between 5 percent and 15 percent in air. These concentrations are usually reached when methane is present in a confined space. Unconfined mixtures of methane in the air are highly diluted and are not usually explosive; however, high concentrations of methane within an enclosed space can explode if exposed to an ignition source. Methane is buoyant at atmospheric temperatures and disperses rapidly in air.

4.12.1 Safety Standards

We received comments regarding the hazards associated with living near a natural gas pipeline and the potential for natural gas leaks and explosions. We also received comments regarding the need for adequate pipeline maintenance during operation. The following section details the safety standards that would apply to the Ruby Pipeline Project.

The DOT is mandated to provide for pipeline safety under 49 USC 601. The Pipeline and Hazardous Materials Safety Administration's (PHMSA), Office of Pipeline Safety (OPS), administers the national regulatory program to ensure the safe transportation of natural gas and other hazardous materials by pipeline. The PHMSA has developed safety regulations and other approaches to risk management that ensure safety in the design, construction, testing, operation, and maintenance of pipeline facilities. The OPS has also developed similar resources for pipeline emergency response activities. Many of the regulations are written as performance standards that set the desired level of safety also and allow the pipeline operator to use various technologies to achieve safe operations.

The PHMSA also ensures that people and the environment are protected from the risk of pipeline incidents. This work is shared with state agency partners and others at the federal, state, and local level. Section 5(a) of the Natural Gas Pipeline Safety Act (NGPSA) requires state agencies to assume all aspects of the safety program for intrastate facilities by adopting and enforcing the federal standards. Section 5(b) permits a state agency that does not qualify under Section 5(a) to perform certain inspection and monitoring functions. A state may also act as DOT's agent to inspect interstate facilities within its boundaries; however, the DOT remains responsible for enforcement actions. Most states have either 5(a) certifications or 5(b) agreements. Nine states act as interstate agents.

The DOT pipeline standards are published in 49 CFR 190-199. 49 CFR 192 specifically addresses natural gas pipeline safety issues. Under a Memorandum of Understanding on Natural Gas Transportation Facilities dated January 15, 1993, between the DOT and FERC, the DOT has the exclusive authority to promulgate federal safety standards used in the transportation of natural gas. Section 157.14 (a) (9) (vi) of the FERC's regulations require that an applicant for a FERC Certificate certify that it would design, install, inspect, test, construct, operate, replace, and maintain the facility for which a Certificate is requested in accordance with federal safety standards and plans for maintenance and inspection or shall certify that it has been granted a waiver of the requirements of the safety standards by the DOT in accordance with Section 3(e) of the NGPSA. The FERC accepts this certification and does not impose additional safety standards other than the DOT standards. If the Commission becomes aware of an existing or potential safety problem, there is a provision in the Memorandum of Understanding that

requires FERC to promptly alert the DOT. The Memorandum of Understanding also provides for referring complaints and inquiries made by state and local governments and the general public involving safety matters related to pipeline under the Commission's jurisdiction.

The FERC also participates as a member of the DOT's Technical Pipeline Safety Standards Committee, which determines if proposed safety regulations are reasonable, feasible, and practicable.

The Ruby Pipeline Project would be designed and constructed to meet or exceed the safety standards established in 49 CFR 192. The regulations are intended to ensure adequate protection for the public and to prevent natural gas facility accidents and failures. The project would be built in accordance with regulations that govern material selection and qualification, minimum design requirements, location adjacent to roads and railroads, and protection from internal, external, and atmospheric corrosion.

49 CFR 192 also defines area classifications based on population density near the vicinity of the pipeline and specifies more rigorous safety requirements for more populated areas. The class location unit is an area that extends 220 yards on either side of the centerline of any continuous 1-mile length of pipeline. The four area classifications are defined as follows:

- Class 1: A location with ten or fewer buildings intended for human occupancy;
- Class 2: A location with more than 10 but less than 46 buildings intended for human occupancy;
- Class 3: A location with 46 or more buildings intended for human occupancy, or where the pipeline lies within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least 5 days per week for 10 weeks in any 12-month period; and
- Class 4: A location with a prevalence of buildings with four or more stories aboveground.

Class locations representing more populated areas require higher safety factors in pipeline design, testing, and operation. Minimum safety factors for each classification area are specified in the safety standards. Consistent with the regulations, the pipeline would be designed utilizing 0.80 and 0.72 design factors in Class 1 areas, a 0.60 design factor in Class 2 areas, and 0.50 design factor in Class 3 areas. Pipelines constructed on land in Class 1 locations in normal soil must be installed with a minimum depth of cover of 30 inches where a 0.72 design factor is used and 36 inches of cover where a 0.80 design factor is used. In consolidated rock, the minimum depth of cover is 18 inches. Pipelines in Class 2, 3, and 4 locations, as well as under drainage ditches of public roads and railroad crossings, must be installed with a minimum cover of 36 inches in normal soil and 24 inches in consolidated rock.

Class locations also specify the maximum distance to a sectionalizing MLV (*e.g.*, 10.0 miles in Class 1, 7.5 miles in Class 2, 4.0 miles in Class 3, and 2.5 miles in Class 4). Pipe wall thickness, pipeline design pressures, hydrostatic test pressures, MAOP, inspection and testing of welds, frequency of pipeline patrols, and frequency of leak surveys must also conform to higher standards in more populated areas. Table 4.12.1-1 identifies the milepost range, class locations, wall thickness, and MAOP for the project.

If a subsequent increase in population density adjacent to the right-of-way indicated a change in class location for the pipeline, Ruby would reduce the MAOP or replace the segment with pipe of sufficient grade and wall thickness to comply with the DOT regulations for the new class location.

49 CFR 192 also would require that Ruby implement several safety measures during the construction and operation of its compressor stations. The piping, fittings, and other components containing natural gas under pressure must be designed with a significant margin of safety above normal

operating parameters. This means the piping must be constructed to safely contain pressures significantly higher than those that are likely to occur at the station. The system must be equipped with safety relief valves set to release gas so that the maximum pressure is never exceeded. The relief valves or over-pressure protection devices must be tested periodically for proper operation and set point and repaired as required. Gas vented to the atmosphere must be directed away from any potential sources of ignition.

TABLE 4.12.1-1

Class Locations for the Ruby Pipeline Project

MP Range	Length (miles)	MAOP (psig)	Pipe Diameter (inches)	Pipe Wall Thickness (inches)	Class Location[a]
0.0 – 5.7	5.7	1,000	42	0.541	1
5.7 – 53.6	47.9	1,440	42	0.541	1
53.6 – 55.1	1.5	1,440	42	0.721	1[b]
55.1 – 105.4	50.3	1,440	42	0.541	1
105.4 – 105.9	0.5	1,440	42	0.865	2
105.9 – 107.2	1.3	1,440	42	0.865	3
107.2 – 109.2	2	1,440	42	0.865	1[c]
109.2 – 675.2	566	1,440	42	0.541	1
0.0_{ℓ} – 2.6_{ℓ}	2.6	1,440	42	0.541	1

a Pipeline classification is based on population density as defined in 49 CFR 192. Design factors are also specified in 49 CFR 192. However, these are the minimum requirements. In many locations, Ruby would utilize a greater design factor than required.
b Designed for Class 2.
c Designed for Class 3.

The Pipeline Safety Improvement Act of 2002 (HR 3609) was signed into law in December 2002. The intent of HR 3609 was to strengthen U.S. pipeline safety laws. HR 3609 required gas transmission operators to prepare a written integrity management program that contained all the elements described in 49 CFR 192.911 and addressed the risks on each covered transmission pipeline segment. Pipeline operators were required to prepare the plan no later than December 17, 2004. The law also establishes the requirement to prepare an integrity management program that applies to all high consequence areas (HCAs). The DOT defines HCAs as they relate to the difference class zones, potential impact circles[10], or areas containing an identified site as defined in 49 CFR 192.903. DOT regulations that define requirements for integrity management plans are found at 49 CFR 192.911.

The DOT published a series of rules from August 6, 2002 to May 26, 2004 (69 FR 29903) that defined those HCAs where a gas pipeline accident could do considerable harm to people and property. In addition, 69 FR 29903 requires that pipeline operators prepare an integrity management program to minimize the potential for an accident. This definition satisfies, in part, the congressional mandate in 49 USC 60109 for OPS to prescribe standards that establish criteria for identifying each gas pipeline facility in a high-density population area. Examples of HCAs might include housing developments, business establishments, or mobile home parks.

An HCA may be established by one of two methods. In the first method, an HCA includes:

[10] The potential impact circle is a circle of radius equal to the potential impact radius (see next footnote).

- Class 3 and 4 locations;
- any area in a Class 1 or 2 location where the potential impact radius[11] is greater than 660 feet and there are 20 or more buildings intended for human occupancy within the potential impact circle; or
- any area in a Class 1 or 2 location where the potential impact circle includes an identified site.[12]

In the second method, an HCA includes any area within a potential impact circle that contains:

- 20 or more buildings intended for human occupancy; or
- an identified site.

Pipeline operators are required to apply elements of an integrity management program to segments of the pipeline that cross HCAs. Currently, there are two HCAs along the Ruby Pipeline Project route: from MP 105.3 to MP 107.1 and from MP 136.3 to MP 137.3. Pipeline segments that cross HCAs must be inspected every 7 years.

49 CFR 192 of the DOT regulations prescribes minimum standards for operating and maintaining pipeline facilities, including the requirement to establish a written plan governing operation and maintenance activities. 49 CFR 92.615 also requires that each pipeline operator establish an emergency plan that includes procedures to minimize the hazards in a pipeline emergency. Emergency plans must contain procedures for:

- receiving, identifying, and classifying emergency events, gas leakage, fires, explosions, and natural disasters;
- establishing and maintaining communications with local fire, police, and public officials and coordinating emergency response;
- initiating the emergency shutdown of the pipeline system and safe restoration of service;
- making personnel, equipment, tools, and materials available at the scene of an emergency; and
- protecting people before property and guarding people from actual or potential hazards.

49 CFR 192 requires that each operator establish and maintain liaison with appropriate fire, police, and public officials to define the resources and responsibilities of each emergency response organization and to coordinate mutual assistance in the event of a pipeline incident. The operator must also establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Ruby would establish and maintain liaison with appropriate fire, police, and public officials in a variety of ways. Communications may involve individual meetings with agency personnel, group meetings, or direct mailings and would include:

- the potential hazards associated with project facilities located in specific service areas;
- preventative measures taken to avoid accidents;
- the types of emergencies that may occur on or near project facilities;

[11] The potential impact radius is calculated as the product of 0.69 and the square root of the MAOP of the pipeline in psi multiplied by the pipeline diameter in inches.

[12] An identified site is an outside area or open structure that is occupied by 20 or more persons on at least 50 days in any 12-month period; a building that is occupied by 20 or more persons on at least 5 days a week for any 10 weeks in any 12-month period; or a facility that is occupied by persons who are confined, are of impaired mobility, or would be difficult to evacuate.

- the purpose and meaning of pipeline markers;
- pipeline location information and the how to use the National Pipeline Mapping System;
- recognition of and response to pipeline emergencies; and
- procedures to contact Ruby for more information.

In addition, Ruby would perform periodic tabletop emergency exercises and mock emergency drills with local governments, law enforcement, and emergency response agencies, subject to agency availability and willingness to participate.

Coordination of mutual response would be accomplished through the use of the Incident Command System, a universal system utilized by all emergency responders. Ruby personnel would be trained on this system and would be required to fully understand their roles and responsibilities within the Incident Command System structure.

Ruby would install a supervisory control and data acquisition (SCADA) system that would allow pipeline operators to monitor pipeline flows and pressures at various points along the system. The SCADA system would allow for remote start and stop of the compressor stations and MLV closure; opening a closed mainline valve would likely require local action. The system would most likely utilize some combination of radio, microwave, and/or satellite communications to transmit data from the pipeline to Ruby's gas control center in Colorado Springs, Colorado.

The SCADA system would enhance the safety of the pipeline as gas control technicians would be able to monitor and react to conditions on the pipeline as needed (gas control technicians would be on duty 24 hours a day, 365 days a year). While leak detection via SCADA systems is not a proven technology for gas pipelines, the gas controller would be able to monitor unexpected pressure changes that could indicate the possibility of a leak. At that point the gas controller on duty could either close the pipeline, block valves upstream and downstream of the apparent leak, and/or dispatch field technicians to investigate the pressure change. The SCADA system also would enhance the reliability of the pipeline system; technicians would not need to travel to remote sites to actuate valves or monitor pipeline operations. Finally, while the SCADA system would not be directly responsible for any of the safety functions such as overpressure protection, the SCADA system would allow the gas control technician monitoring the pipeline to detect incipient issues and take actions to avoid problems. For example, if pipeline pressures downstream of a compressor station begin to rise rapidly because a customer unexpectedly reduces their natural gas receipts from the pipeline, the gas control technician could slow or stop the upstream compression to control the rising pressure.

We received comments during scoping regarding the potential for increased wildfire hazard from high risk equipment (*e.g.*, exhaust pipes, welding torches, *etc.*) operating on the right-of-way during construction. Ruby has prepared a Fire Prevention and Suppression Plan (see Appendix H) to prevent and respond to wildfires during construction. Ruby's plan includes requirements for training, equipment, and monitoring, and establishes protocols and lines of communication to report fires. The plan also increases fire prevention and response commitments during high-risk fire periods.

We also received comments regarding the potential for increased wildfire hazard from OHV use on the right-of-way during operation. Ruby's Restoration and Revegetation Plans (Appendix L) includes measures to discourage such use of the pipeline right-of-way, including leaving the right-of-way in a roughened condition; placing signage in key areas; and installing rock barriers, earthen berms, or other barricades at existing OHV routes that cross the right-of-way. Ruby has also committed to work closely with the BLM, USFS, Reclamation, landowners, grazing lessees, local law enforcement personnel, and

adjacent landowners to monitor and eliminate unauthorized access to the right-of-way by installing exclusion fencing on a case-by-case basis.

Finally, we received comments regarding risk for wildfire as a result of increased fuel loads from placing cut vegetation back on the right-of-way after construction. Ruby has committed to work with fire response and land managing agencies to identify areas where placing cut vegetation back on the right-of-way may create a potential fire hazard and restrict this practice in those areas.

Based on the above commitments, we believe there would not be a significant risk of construction-related fires from high risk equipment, use of OHVs within the right-of-way, or increased fuel loads.

4.12.2 Pipeline Accident Data

49 CFR 191, as originally written in February 1970, requires that all operators of transmission and gathering systems notify the DOT of any reportable incidents. Pipeline operators also are required to submit a DOT incident report (Form F7100.2) within 20 days of any incident. Reportable incidents are defined as any leaks that:

- caused a death or personal injury requiring hospitalization;
- required any segment of power line to be removed from service;
- resulted in gas ignition;
- caused estimated damage to the property of the operator, or others, or both, in an amount of $5,000 or more;
- required immediate repair of a power line;
- occurred while testing with gas or another medium; or
- in the judgment of the operator, was significant even though it did not meet the above criteria.

The DOT amended 49 CFR 191 in June 1984 and changed a number of incident reporting requirements. The new regulations required that operators only report incidents that involve property damage of more than $50,000, injury, death, release of gas, or that are otherwise considered significant by the operator. Table 4.12.2-1 presents a summary of incident data from 1970 to mid-1984 and incident data from mid-1984 through 2008.

TABLE 4.12.2-1

Natural Gas Service Incidents by Cause

	Incidents per 1,000 miles of pipeline			
Cause	1970 to Mid-1984	Percent of Total, 1973 to Mid-1984	Mid-1984 to 2008	Percent of Total, Mid-1984 to 2008
Outside Forces	0.70	54	0.13	42
Corrosion	0.22	17	0.07	23
Construction or Material Defect	0.27	21	0.05	16
Other	0.11	8	0.06	19
Total	**1.30**		**0.31**	

During the 14.5-year period from 1970 to mid-1984, about 5,862 service incidents were reported on more than 300,000 total miles of natural gas transmission and gathering systems nationwide. Service incidents, defined as failures that occur during pipeline operation, remained fairly constant over this period with no clear upward or downward trend in annual totals. During the 24.5-year period from mid-1984 to 2008, about 2,374 service incidents were reported over about the same miles of pipeline, likely attributed to the change in reporting requirements. Again, service incidents remained fairly constant over this period. The one exception is an upward trend in incidents (about 43 percent) over the last 5 years.

We received comments regarding the potential for third-party damage to the pipeline to cause a pipeline incident. Incidents are mostly caused by outside forces, including encroachment of mechanical equipment such as bulldozers and backhoes; earth movements due to soil settlement, washouts, or geologic hazards; weather effects such as winds, storms, and thermal strains; and willful damage. Table 4.12.2-2 presents a percentage breakdown of incidents caused by outside forces. Most notable is a downward trend in third-party damage since 1984. Since April 1982, pipeline operators have been required to participate in one-call public utility programs in populated areas to minimize unauthorized excavation activities in the vicinity of pipelines. The one-call program is a service used by public utilities and some private sector companies (*e.g.*, oil pipelines and cable television) to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts. Ruby would support and actively participate in the one-call program.

Pipelines included in the data presented in table 4.12.2-2 vary widely in terms of age, pipe diameter, and level of corrosion control. Each variable influences the incident frequency that may be expected for a specific segment of pipeline.

TABLE 4.12.2-2

Outside Forces Incidents by Cause[a]

Cause	1970 to mid-1984 (percent)[b]	2002 to 2008 (percent / incidents per 1,000 miles of pipeline)
Third-Party Damage	67	51 / 0.69
Natural Forces (Weather or Earth Movement)	24	26 / 0.35
Pipeline Operator Damage	7	9 / 0.12
Other or Unknown	2	14 / 0.19

a Data for the period from mid-1984 to 2001 were not provided due to the lack of reporting consistency for natural forces.
b Incidents per 1,000 miles of pipeline was not available for this time period.

The frequency of service incidents is largely dependent on the age of the pipeline. Pipelines installed since 1950 exhibit a fairly constant level of service incident frequency. However, pipelines installed before 1950 have a significantly higher rate of incident, partially due to corrosion (as corrosion is a time-dependent process). New pipe generally is equipped with more advanced coatings and cathodic protection to reduce corrosion potential.

Older pipelines also have a higher frequency of incidents due to outside force because their locations may be less well-known and well-marked than newer lines. In addition, older pipeline systems often contain a disproportionate number of small-diameter pipelines, which have a greater rate of incidents caused by outside forces. Small diameter pipelines are more easily crushed or broken by mechanical equipment or earth movements.

Table 4.12.2-3 demonstrates the effectiveness of corrosion control in reducing the incidence of failures caused by external corrosion. The data show that the rate of incidents has decreased about 96 percent from the 1970 to 1984 period to the current period. Pipelines installed after July 1971 must have both an external protective coating and a cathodic protection system. The use of these two safety measures has significantly reduced the rate of pipeline failure. The data also shows that coated and cathodically protected pipe have a higher incident rate than unprotected pipe. This anomaly reflects the pipeline industry's initiative to retrofit old pipe with cathodic protection and the resultant decrease in miles of unprotected pipe.

TABLE 4.12.2-3

Corrosion-Related Incidents

Cause	Incidents per 1,000 miles of pipeline			
	1970 to mid-1984	Percent of Total, 1973 to mid-1984	mid-1984 to 2008	Percent of Total, mid-1984 to 2008
None (Bare Pipe)	0.42	22	0.003	5
Cathodic Protection Only	0.97	51	0.005	9
Coated Only	0.40	21	0.004	6
Coated and Cathodic Protection	0.11	6	0.051	81
Total	**1.90**		**0.063**	

We received comments on how Ruby would address unauthorized encroachments on its facilities, particularly for landowners and contractors who do not use the one-call program prior to digging. We also received a comment regarding identification of safe setback distances for living or working near a pipeline. Currently, there are no federally mandated distances identifying setbacks from homes or businesses. The DOT has a minimum separation distance between pipelines and other underground structures; however, natural gas pipelines are routinely located adjacent to homes and businesses.

Ruby would actively participate in the nationwide one-call program. In the event that an encroaching party has proposed to construct near the pipeline or is identified constructing in the area of the pipeline without using the one-call system, Ruby has indicated it would first educate the encroaching party of the one-call program and the potential consequences of not using the system. If the encroaching party was aware of one-call requirements and elected not to use the program, a warning letter would be sent to further emphasize Ruby's request to use the one-call program and follow accepted safety practices in the future. Ruby would also consider seeking appropriate injunction relief from a court to prevent damage to the pipeline and achieve compliance with one-call requirements. Ruby would pursue reimbursement in the event that damage to the pipeline occurred as a result of the non-compliance with the one-call system. Ruby also would pursue imposition of any civil penalties, as appropriate. Events of this type would be reported and evaluated through normal internal reporting processes. Additional efforts (patrolling, *etc.*) would be instituted, as necessary, to ensure the safety of people and the pipeline. Further, each state's Department of Transportation could pursue action against violators in accordance with applicable law.

4.12.3 Impact on Public Safety

The service incident data summarized in table 4.12.2-1 include pipeline failures of all magnitudes with widely varying consequences. About two-thirds of the incidents were classified as leaks, and the remaining third were classified as ruptures, implying a more serious failure.

From 1970 to mid-1984, an average of 5.0 fatalities per year occurred on natural gas transmission and gathering lines. Pipeline fatalities decreased from mid-1984 to 2008 to 3.1 fatalities per year. Table 4.12.3-1 presents the nationwide totals of accidental fatalities from various hazards in 2000 to 2005 (average per year) so as to provide a relative measure of the industry-wide safety of natural gas pipelines. Direct comparisons between accident categories should be made cautiously, however, because individual exposures to hazards are not uniform among all categories. Nevertheless, the natural gas transmission and gathering industry's average number of fatalities from 2000 to 2005 of 3.16 fatalities per year (from PHMSA) is relatively small considering the approximate 327,000 miles of transmission and gathering lines in-service nationwide. The fatality rate is between 100 to 10,000 times lower than the fatalities from other accidental causes. Furthermore, the natural gas transmission and gathering industry's accidental fatality rate continued to decline in 2006 (3 fatalities), 2007 (2 fatalities), and 2008 (0 fatalities).

TABLE 4.12.3-1

Nationwide Accidental Fatalities Per Year from Various Hazards (2000-2005)

Cause	Average Number of Fatalities Per Year (2000-2005)	Percent of Total
Motor Vehicle Traffic	43,157	44
Falls	16,715	17
Poisoning	18,068	19
Unspecified	6,633	7
Suffocation	5,682	6
Fire/burn	3,375	3
Drowning	3,401	4
Total	**97,030**	

a National Center for Injury Prevention and Control (Web-based Injury Statistics Query and Reporting System)

The available data show that natural gas pipelines continue to be a safe, reliable means of energy transportation. Based on about 327,000 miles of pipe in service, the rate of public fatalities for the nationwide mix of transmission and gathering lines in service is 0.01 public fatalities per year per 1,000 miles of pipeline. Therefore, the project could result in one fatality every 154 years. This would represent a slight increase in risk to the nearby public.

One commenter expressed concern about the potential for cattle to be drawn to the newly revegetated right-of-way adjacent to Highway 30 in Utah, and the potential for those cattle to create a traffic hazard with vehicles traveling on the highway. We anticipate that revegetation in this area would be a gradual process and would not be any more likely to draw cattle onto the highway than adjacent areas; therefore, we do not believe revegetation of the right-of-way in this area would be a hazard to public safety. Further, Ruby would repair or replace cut and damaged fences during restoration to contain livestock in active allotments and grazed areas. The BLM also has indicated that it would require Ruby to

gate and fence disturbed areas on BLM-administered land in western Box Elder County, Utah to keep livestock and OHVs off restored areas until vegetation has become established. Western Box Elder County is the location where the pipeline parallels Highway 30 in Utah.

We also received comments during the draft EIS comment period noting that construction and other activities may result in an increase in vehicle traffic collisions (with other vehicles, pedestrians, and wildlife). Ruby stated that it would require its contractors to comply with its safety procedures and policies (including complying with posted speed limits). Ruby and its contractors would report any vehicle accidents involving construction personnel to the appropriate authorities. Ruby has committed to reviewing and discussing safety and notification requirements with its contractors prior to construction and to providing additional training during construction, as necessary. In addition, Ruby would invite each state's wildlife agency to review wildlife concerns and notification requirements regarding vehicle traffic/wildlife collisions prior to construction.

4.12.4 Terrorism and Security Issues

In the aftermath of the terrorist attacks that occurred on September 11, 2001, terrorism has become a very real issue for the facilities under the Commission's jurisdiction. The FERC, like other federal agencies, is faced with a dilemma in how much information can be offered to the public while still providing a significant level of protection to energy facilities. Consequently, the FERC has removed certain energy facility design plans and location information from its internet website to ensure that sensitive information is not readily available (per RM02-4-000 and PL02-1-000, issued February 20, 2003).

Since September 11, 2001, the FERC has been involved with other federal agencies in developing a coordinated approach to protecting the energy facilities of the United States, and continues to coordinate with these agencies to address this issue. A Security Task Force has been created and is addressing ways to improve pipeline security practices, strengthen communication within the industry and the interface with government, and extend public outreach efforts.

Increased security awareness has occurred throughout the industry and the nation. The Office of Homeland Security was established with the mission of coordinating the efforts of all executive departments and agencies to detect, prepare for, prevent, protect against, respond to, and recover from terrorist attacks within the United States. The FERC, in cooperation with other federal agencies and industry trade groups, has joined in the efforts to protect the energy infrastructure, including the approximate 327,000 miles of interstate natural gas transmission and gathering pipelines.

Safety and security are important considerations in any Commission action. The attacks of September 11, 2001 have changed the way pipeline operators as well as regulators must consider terrorism, both in approving new projects and in operating existing facilities. However, the likelihood of future attacks of terrorism or sabotage occurring along the Ruby Pipeline Project, or at any of the myriad natural gas pipeline or energy facilities throughout the United States, is unpredictable given the desperate motives and abilities of terrorist groups. The continuing need to construct facilities to support the future natural gas pipeline infrastructure is not diminished from the threat of any such future acts. Moreover, the unpredictable possibility of such acts does not support a finding that this particular project should not be constructed.

4.12.5 Non-Jurisdictional Electric Power Lines

The Rocky Mountain Power and Harney Electric Cooperative electric power lines would be designed and operated to meet or exceed the standards of the National Electrical Safety Code and state

safety requirements. The dangers of electricity are commonly understood and involve a variety of hazards. The risks inherent with electric power can generally be divided into two categories: direct and indirect. The direct danger is the damage that the power itself can do to the human body, such as stoppage of breathing or regular heartbeats, or burns. The indirect dangers of electricity include the damages that can result to the human body as a result of something caused by electric shock, such as a fall, an explosion, or a fire. To prevent accidents and maintain safe facilities, Rocky Mountain Power and Harney Electric Cooperative would generally prohibit or restrict certain activities on their electric line rights-of-way, including operating heavy equipment, installing metal, constructing buildings, and certain types of recreating (*e.g.*, flying kites or model airplanes).

4.13 CUMULATIVE EFFECTS

NEPA requires that federal agencies consider the cumulative impacts of proposals under their review. Cumulative impacts are defined in the CEQ regulations at 40 CFR 1508.7 as "…the impact on the environment that results from the incremental impact of the action when added to other past, present, and reasonably foreseeable actions regardless of what agency…or person undertakes such other actions." These actions can include previously approved or conducted actions as well as pending actions with the FERC or other federal, state, and local agencies, plus privately financed projects when they have overlapping impacts with the environmental resources that the Ruby Pipeline Project would impact. Although the individual impacts of each project might not be significant separately, the additive effects of multiple projects could be significant.

Cumulative impact analyses are used to consider and modify projects if adverse cumulative impacts have been identified and may be avoidable; to determine if additional or more appropriate project mitigation is necessary; and to include effective monitoring of any impact(s) of concern in project implementation. To meaningfully address and achieve these purposes and to avoid lengthy discussions of inconsequential impacts and projects, the cumulative impact analysis for the Ruby Pipeline Project was conducted in the following manner:

- Projects and activities included in this analysis are those having impacts on resources that overlap with the predicted impacts of the Ruby Pipeline Project. Generally, these projects are located in the same vicinity (within the same counties) directly affected by construction of the Ruby Pipeline Project. Most effects of more distant projects are not assessed because their impact would generally be localized and not contribute significantly to impact associated with the proposed project. The obvious exception to this approach involves air quality, which is considered on a regional basis.

- Other projects were identified from information provided by Ruby, field reconnaissance, Internet research, scoping comments, and communications with federal, state, and local agencies. Where the analysis indicated a potential for cumulative impacts, information has been quantified to the extent feasible; however, quantitative details about future projects and their potential impacts are conceptual, indeterminate, and only can be described qualitatively. Economic conditions, the availability of financing, the issuance of permits, and a project's construction schedule can all affect how a project is quantified.

- The temporal range, or how far into the future we conducted our analysis, was based on whether the effects would be short-term, long-term, or permanent. Most impacts would occur during the construction phase of the project which Ruby has projected to occur from about spring 2010 to early 2011. The temporal range was extended for any impacts

resulting from construction or operation of the project that would result in long-term or permanent impacts. Examples of long-term or permanent impacts include conversion or loss of certain habitats (*e.g.*, upland and riparian forest; forested wetland; sagebrush steppe) as well as habitat fragmentation.

- Potential cumulative impacts are discussed for each resource category analyzed in the EIS. For each resource, first the direct and indirect impacts of the project are briefly summarized. Then, any past impacts from other projects on that resource are described. Finally, any potential impacts from present and reasonably foreseeable future actions are considered.

Table 4.13-1 lists past, present, and reasonably foreseeable future projects or activities that may cumulatively or additively impact resources that would be affected by the construction and operation of the Ruby Pipeline Project. Figure 4.13-1 illustrates the locations of these projects. These projects and activities are discussed below.

TABLE 4.13-1

Projects with Potential Cumulative Impacts on Resources Within the General Area of the Ruby Pipeline Project

Project / Activity	Counties/State Where Project Coincides with the Ruby Pipeline Project	Description	Date of Construction or Project Status
Moxa Arch Area Infill Gas Development Project	Lincoln and Uinta, WY	Up to1,861 new natural gas wells and the installation and operation of additional ancillary facilities in southwestern WY	2010 - 2020
Jordan Cove LNG Import Terminal & Pacific Connector Pipeline Project	Klamath, OR	LNG import terminal and 230-mile-long, 36-inch-diameter natural gas pipeline from the terminal to two interconnects with markets in the region	Undetermined
Energy Gateway Project	Lincoln and Uinta, WY; Box Elder, UT; Lake and Klamath, OR	1,900 miles of new electric power lines across the western United States	2007 - 2014
Brigham City Area Residential Developments	Box Elder, UT	Flat Bottom Canyon and Skyline Terrace residential developments	Undetermined
Upper Willow Creek Enhancement Project	Elko, NV	Habitat restoration project on retired ranch land in the Willow Creek watershed	2005 - Present
Southwest Intertie Project	Elko, NV	515-mile-long electric power line from southern Idaho to southern Nevada	2009 - 2011
China Mountain Wind Project	Elko, NV	Eight existing and three proposed meteorological towers to support development of a 185-turbine wind farm	2002 - 2012
Canada – Pacific Northwest – Northern California Transmission Project	Klamath, OR	1,000-mile-long electric power line from British Columbia to California	2009 - 2015

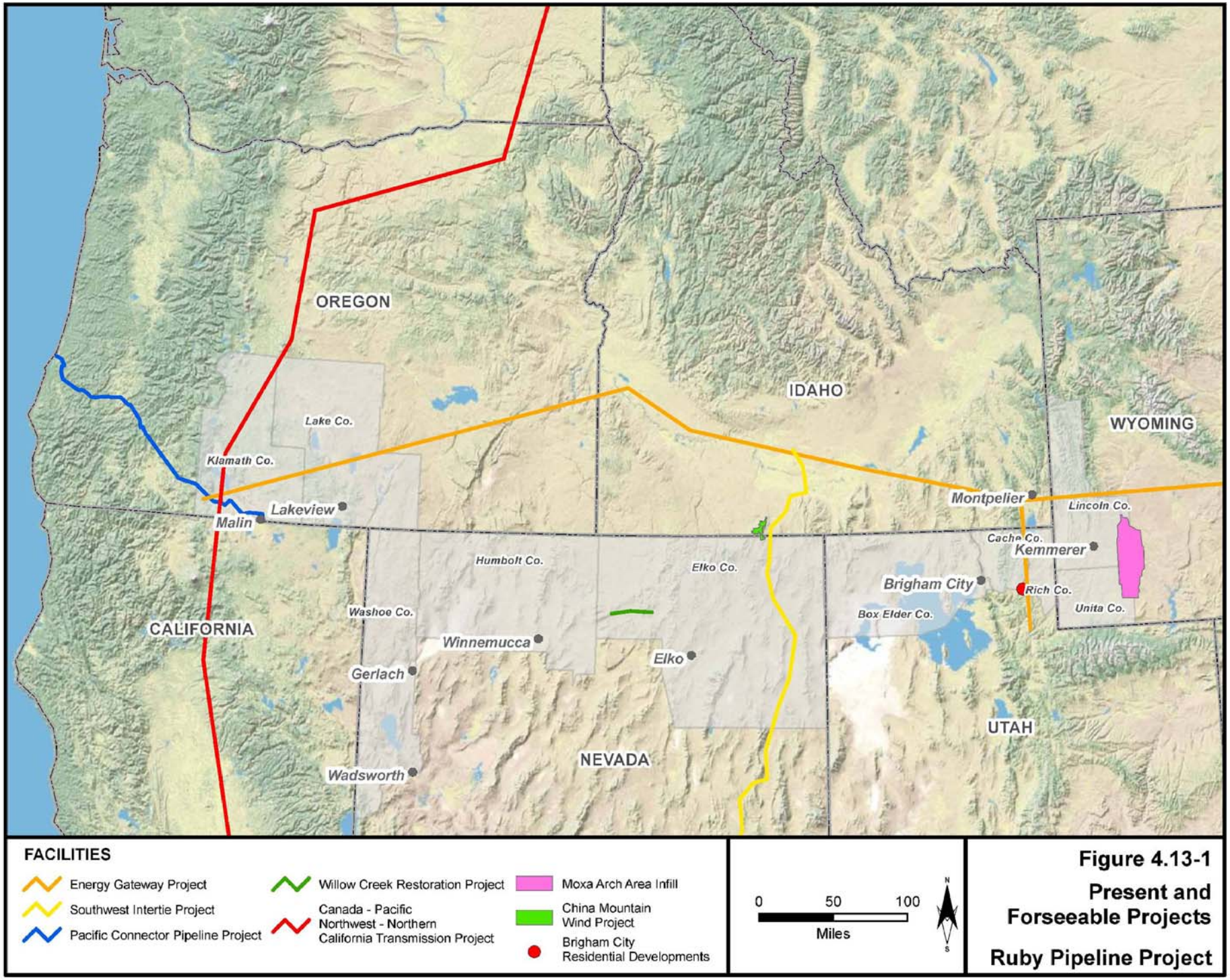

Figure 4.13-1
Present and Forseeable Projects
Ruby Pipeline Project

The draft EIS included a discussion of potential cumulative impacts associated with the proposed Sunstone Pipeline Project, a 560-mile-long, 36-inch-diameter natural gas pipeline that would have extended from Opal, Wyoming to Stanfield, Oregon. On November 5, 2009, Sunstone terminated its pre-filing process with the FERC, effectively cancelling the project. Therefore, we have not included a discussion of this project in the final EIS. We also received comments during the draft EIS comment period regarding the potential cumulative impacts of the Ruby Pipeline Project on the proposed upgrade of the Nevada Northern Railroad, which would have transported coal to the White Pine Energy Station, a 1,590 MW coal-fired power plant. This portion of the railroad is currently inactive, deteriorated, and is incapable of carrying commercial freight. However, the project's sponsors announced in March 2009 that construction of the White Pine Energy Station had been indefinitely postponed. Therefore, we have not included a discussion of this project in the final EIS.

The potential for wildfires as a result of construction of the pipeline is discussed in section 4.12.1. Wildfires are part of the ecological regime (not projects) and, as such, are considered part of the environmental baseline of the area. They are not discussed as projects with cumulative effects in section 4.13. Additionally, livestock grazing has occurred throughout western United States for more than a century. The presence of a pipeline, such as the Ruby pipeline, would not necessitate any change in grazing practices within the project area after construction, except perhaps for allowing vegetation on the right-of-way to become reestablished before reintroducing livestock. Because grazing has occured in the project area in the distant as well as the near past, and because grazing is likely to continue in the project area into the foreseeable future, grazing is considered part of the ecological regime (not a project or projects) and, as such, is considered part of the environmental baseline of the area. The impacts of the proposed project on the same resources affected by grazing are, however, evaluated throughout this EIS. Speculating as to how public policy would or should change with regard to grazing is beyond the scope of this EIS.

Moxa Arch Area Infill Gas Development Project

EOG Resources, Inc. and other companies are proposing to expand existing natural gas drilling and field development operations in the Moxa Arch Area of southwestern Wyoming. The Moxa Arch Area Infill Gas Development Project encompasses approximately 475,808 acres of federal, state, and private lands in Sweetwater, Lincoln, and Uinta counties, Wyoming. The project would involve drilling up to 1,861 new wells and the installation and operation of additional ancillary facilities, including roads; gas pipelines; and separation-dehydration, metering, and fluid storage facilities. Wells would be drilled to depths of 11,000 to 12,000 feet. Densities would range from 2 to 12 wells per square mile. The project is expected to commence in 2010 and end in 2020. The precise locations where these wells would be drilled are not known at this time. The area of surface disturbance associated with drilling and completion activities would be approximately 18,650 acres over a 10-year drilling schedule. After interim reclamation is completed, the area of long-term disturbance associated with project development would be approximately 5,997 acres. Potential cumulative impacts of the Ruby Pipeline Project and Moxa Arch Area Infill Gas Development Project would be limited to Lincoln and Uinta counties.

Jordan Cove LNG Import Terminal and Pacific Connector Pipeline Project

Subsidiaries of Williams, PG&E, and Fort Chicago Energy Partners L.P. are jointly pursuing construction of the Jordan Cove LNG import terminal and the Pacific Connector Pipeline Project, an interstate natural gas transmission system. The Jordan Cove LNG terminal, if built, would be capable of receiving LNG supplies from oversea production areas. Pacific Connector would be a 230-mile-long, 36-inch-diameter pipeline designed to transport up to 1 bcf per day of natural gas from the Jordan Cove LNG terminal to markets in the Pacific Northwest, northern California, and northern Nevada. On May 1, 2009,

FERC issued a final EIS evaluating the environmental impacts associated with the proposed Jordan Cove and Pacific Connector projects. The Commission authorized this project on December 17, 2009. The only county common to the Jordan Cove LNG import terminal, the Pacific Connector Pipeline Project, and the Ruby Pipeline Project is the Pacific Connector pipeline in Klamath County, Oregon. Any cumulative impacts would be limited to this county.

Energy Gateway Project

Rocky Mountain Power proposes two 345-kilovolt electric power lines parallel to the Ruby Pipeline Project between MPs 105.7 and 108.5, near Brigham City, Utah. This work is part of a larger project known as the Energy Gateway Project, to expand Rocky Mountain Power's electric transmission program. The project would add more than 1,900 miles of new electric power lines across the western United States. The purpose of the Energy Gateway Project is to provide access to areas of strong renewable development potential, such as wind, solar, biomass, and geothermal. Construction of the project began in 2007. Major segments are scheduled be online by 2014. The counties common to both the Energy Gateway Project and the Ruby Pipeline Project are Lincoln and Uinta counties, Wyoming; Box Elder County, Utah; and Lake and Klamath counties, Oregon.

Brigham City Area Residential Developments

Ruby contacted planning and development offices in each of the counties crossed by the project to determine if any residential and/or commercial developments were planned within 0.25 mile of the project. Ruby identified two residential developments within 0.25 mile of the pipeline route, both near Brigham City in Box Elder County, Utah. The first residential development, Flat Bottom Canyon, would be located at about MP 105. The second residential development, Skyline Terrace, would be located at about MP 107. The developers of Flat Bottom Canyon have not filed a master plan with the Brigham City Planning and Zoning Office. The developers of Skyline Terrace have filed a preliminary design with the same office, which has yet to respond to the design. If and when these projects would be approved and built is still unknown. Potential cumulative impacts associated with the Ruby Pipeline Project and these two developments would be limited to Box Elder County.

Upper Willow Creek Enhancement Project

The Upper Willow Creek Enhancement Project is a wildlife habitat enhancement initiative on public and private lands being implemented by Barrick Goldstrike Mines, Inc. and the BLM about 50 miles northwest of Elko, Nevada. The project was initiated to mitigate the effects of mining on the Carlin Mining Trend to the southeast. The project would help to enhance greater sage-grouse, mule deer, and Lahontan cutthroat trout habitats while still allowing livestock grazing. These three species are featured in the Elko Resource Management Plan. Collectively, at least 250 wildlife species, including those designated as special status species or migratory birds, would benefit from improved forage and cover diversity on uplands and improvement of riparian and meadow conditions. The Ruby Pipeline Project would pass within about 500 feet of the southwest corner of the enhancement area at MP 367.5. Any cumulative impacts would be limited to Elko County.

Southwest Intertie Project

The Southwest Intertie Project is a 515-mile-long power line running from southern Idaho to southern Nevada. It is being developed by Great Basin Transmission, LLC to transport power generated from alternative energy sources including solar, wind, and geothermal power. The project is divided into two phases: the southern portion scheduled to be operational in 2010 and the northern portion to be

operational in 2011. The Southwest Intertie Project would cross the proposed Ruby Pipeline Project in northeastern Elko County, Nevada, between approximately MPs 267 and 270. The project has obtained a number of federal, state, and local approvals, and the project's owners are currently finalizing financing. Construction may start as early as September 2009. Construction of the Southwest Intertie Project would involve placement of transmission towers well outside of the Ruby right-of-way, though the power lines would cross over the right-of-way. Depending on the Southwest Intertie Project construction plan, that project's access roads would cross the Ruby right-of-way. Any cumulative impacts would be limited to Elko County.

China Mountain Wind Project

We received comments during the draft EIS comment period regarding the potential cumulative impacts of the project and the proposed China Mountain Wind Project. The China Mountain Wind Project would involve the construction of a 425-MW wind power facility and associated power lines in Twin Falls County, Idaho, and Elko County, Nevada. The project would include up to 185 turbines, a number of meteorological towers, and would use 4.2 miles of existing BLM-managed access roads. Certain components of the project have already been constructed; eight towers were built in 2002, one tower was built in 2005, and three more towers were built in 2008. In May 2007, the project's developers submitted an application to the BLM to construct and operate the wind power generation facility. In June 2008, the project developer requested to amend the right-of-way grant to construct three additional meteorological towers to support the data gathering for the project. The BLM held public scoping meetings on the project in June 2008 and most recently completed an EA in March 2009 for the three additional meteorological towers (BLM, 2009c). The BLM is currently preparing a draft EIS on the entire wind farm project, which should be available for public review in early 2010, with a final ROD and EIS completed in summer 2011. The complete extent of the project (turbine locations, *etc.*) is not known at this time. Based on our current knowledge regarding the project, no components of the China Mountain Wind Project would overlap or occur within the Ruby Pipeline Project right-of-way. Any cumulative impacts would be limited to Elko County.

Canada - Pacific Northwest - Northern California Transmission Project

We received comments during the draft EIS comment period regarding the potential cumulative impacts of the project and the proposed Canada - Pacific Northwest - Northern California Transmission Project. Sponsors of the Canada - Pacific Northwest - Northern California Transmission Project, including PG&E, are currently analyzing the feasibility of constructing a high-voltage electric power line that runs from British Columbia, through Washington, Oregon, and terminates east of the San Francisco metro area (PG&E, 2009). The power line would be intended to access new renewable energy resources and to increase the reliability of interconnected electrical networks, and could be operational as early as 2015. Project sponsors have not yet determined a final route but are currently evaluating resources present within a 40-mile-wide, 1,000-mile-long study area. The line, if permitted as presented in recent sponsor publications, would likely travel to the west of Malin, Oregon. The only county common to both projects is Klamath County, Oregon. Any cumulative impacts would be limited to this county.

4.13.1 Geology

Mineral Resources

Ruby's facilities would be expected to have a temporary impact on near-surface geology. During construction, Ruby would implement site-specific construction techniques and best management practices to mitigate local geological hazards that could not be completely avoided. Implementation of Ruby's

Plan and Procedures would minimize or avoid the potential for construction to adversely affect slope stability at geologic hazard sites that are presently known or discovered during construction. Because these effects would be highly localized and limited primarily to the period of construction, cumulative impacts would only occur if other projects involve excavation and are constructed at the same time and place as the facilities proposed by Ruby. None of the other projects meet these criteria.

The project area has experienced impacts on and losses of geological resources due to resource extraction and development, including oil, gas, coal, ores, salts, precious and semiprecious stones, sand, gravel, and clay. Active, inactive, and planned mining sites within 1,500 feet of the Ruby Pipeline Project are identified in section 4.1.2.1. Other than mineral material sites (rock quarries), there are no reasonably foreseeable mining projects that would contribute to cumulative effects in the project area.

Generally, linear projects such as pipelines, electric power lines, railroads, and roadways in the affected region have impacts on mineral resources similar to those of the Ruby Pipeline Project. The construction of these other projects would preclude extraction of sand and gravel and other minerals, such as coal, from within and near the permanent rights-of-way. Some resources, such as oil and gas production, could still be extracted through offsets and directional drilling or mining. The project area is generally remote with vast undeveloped resources and inactive mining claims. The Ruby project has little potential for cumulative impacts on mineral resource development.

The projects identified in table 4.13-1 may remove mineral resources such as rock, sand, and gravel from area quarries/borrow pits for maintenance of existing roads or other uses. Removal of these resources from quarries/borrow pits owned by the BLM or by other public and private parties for the Ruby Pipeline Project or any other project would only occur at the discretion of the quarry/pit owner. Any gravel or rock needed for future use, as identified by a land managing agency, would be reserved and not sold. However, excess rock generated by pipeline construction could be stored in the quarries for reuse or sold by the quarry owner in the future. The intended use of a quarry or borrow pit is to generate mineral resources to support construction projects. The use of these resources for a project would result in a permanent impact, regardless of whether the resource was used for the Ruby Pipeline Project. Mineral resource use by the Ruby Pipeline Project or other projects identified in table 4.13-1 may accelerate the rate at which mineral resources from quarries/borrow pits would be utilized; however, the use would be unlikely to change the net cumulative impact.

Paleontological Resources

The Ruby Pipeline Project would cross about 255 miles of geologic formation that has moderate to high potential to contain significant fossils. Almost any excavation activity associated with regional projects has the potential to destroy or uncover fossils of potential scientific importance. Construction of pipelines, roads, natural gas wells, and other surface-disturbing activities in the area have previously removed some surficial paleontological resources. The proposed project could contribute to the cumulative exposure and potential loss of scientifically valuable fossils. However, Ruby would implement its Paleontological Resources Monitoring Plan (Appendix I) to monitor construction for the presence of paleontological resources in high-potential areas. If fossil occurrences of scientific significance are found, Ruby would collect, assess, and curate into the permanent collections of an established institution a representative sample of the find. Doing so would ensure that new scientific information would be collected and added to the existing body of knowledge. Thus, we do not believe there would be significant cumulative effects to paleontological resources from the Ruby Pipeline Project.

4.13.2 Soils

Past land uses within areas crossed by the proposed project have disturbed soils during land clearing, residential development, forest harvest, agricultural use, mining, livestock grazing, road development, and oil and gas exploration and production. These past actions have removed soil cover and have altered soils and increased erosion potential and sediment yield. Any increase in land clearing and soil disturbance due to project construction and operation has the potential to contribute to direct cumulative impacts.

The Energy Gateway Project would parallel about 2.8 miles of the Ruby Pipeline Project. Soil disturbance associated with the electric power lines mainly would be limited to locations where pylons would be sited; however, disturbance from construction equipment traveling on the right-of-way could also occur. Assuming that a 115-foot-wide construction right-of-way is used to construct the electric power line, we have conservatively estimated that the additional soil disturbance from the Energy Gateway Project where it parallels the Ruby Pipeline Project would be 39 acres.

The Southwest Intertie Project would cross the proposed Ruby Pipeline Project in northeastern Elko County, Nevada, between approximately MPs 267 and 270. As with the Energy Gateway Project, cumulative effects to soil resources could occur in the area of crossing, depending on the location of the power line pylons. The existence of the pipeline would preclude placement of any power line structure in the right-of-way; therefore, cumulative impacts associated with this crossing would be minor.

Potential cumulative erosion could occur where construction disturbance areas overlap or are located near each other. However, the existing pipeline, utility, roadway, and oil and gas projects have been in-place for a number of years and these construction rights-of-way have been partially or completely restored. The potential for cumulative erosion from one or more of these projects is temporary and low because erosion control practices would be applied to the Ruby Pipeline Project and likely to other projects. Although erosion is always a concern, it is not considered to be a major risk. The Upper Willow Creek Enhancement Project is dedicated specifically to stabilizing soils and restoring habitat from overgrazed, fire-damaged ranch lands. We do not expect the Ruby Pipeline Project to significantly contribute to the cumulative impact on soils.

4.13.3 Water Resources

Groundwater

Ruby has indicated that it may use approximately 337.9 million gallons of groundwater for hydrostatic testing and dust control. The Pacific Connector Pipeline Project would also involve use of up to 87.3 million gallons of groundwater for hydrostatic testing. Groundwater for hydrostatic testing and dust control would be a short-term, limited use. Construction of power lines and residential developments would require little to no groundwater, except perhaps a small amount for dust control. Once operational, pipeline and other utility projects do not typically use much groundwater. However, once constructed, groundwater may be used as the source of water for the residential developments near Brigham City. All projects identified in this cumulative effects analysis would be required to obtain water use permits and would implement spill containment and control plans as required by federal and state agencies. No significant or long-term cumulative impacts would be expected on groundwater.

Surface Water

Pipeline waterbody crossing impacts are generally localized and short term. Several projects could contribute to cumulative surface water impacts. The Energy Gateway Project and the Southwest Intertie Project would cross above two and three intermittent waterbodies, respectively, that also would be crossed by the Ruby Pipeline Project. Little or no additional work associated with the Energy Gateway Project or the Southwest Intertie Project would be conducted in the streams themselves, except that construction equipment may bridge over or pass through the waterbody while travelling down the right-of-way. The Upper Willow Creek Enhancement Project is specifically aimed at improving the quality of Willow Creek for the Lahontan cutthroat trout through habitat improvement measures. Cumulative impacts associated with these projects would be short-term and minor, and in the case of the Upper Willow Creek Enhancement Project, beneficial.

Wetlands

Cumulative wetland impacts would occur if more than one project were affecting the same wetland at the same location at the same time, where wetlands are permanently drained or filled, and where wetland characteristics and functionality are altered by construction and operational activities. The Ruby Pipeline Project would not affect the same wetland at the same location and time as other projects. Nor would the Ruby project permanently fill or drain wetlands. Many projects, especially linear projects such as pipelines and power lines, could temporarily affect wetlands during construction; however, restoration measures employed by each project should ensure wetlands are fully restored. Operation of these utilities would require maintenance and vegetation clearing along the utility rights-of-way, which could alter the vegetation component of various wetlands. For instance, operation of the project would convert 0.1 acre of forested habitat to an herbaceous wetland type. Operation of the Pacific Connector pipeline would convert 1.1 acres of forested wetland and 0.1 acre of scrub-shrub wetland to a herbaceous wetland type. No significant cumulative impact on wetlands would occur.

All project applicants would be subject to conditions contained in the COE's Section 404 permits and state water quality permits. Compensatory wetland mitigation may be required in certain circumstances to replace wetlands permanently impacted by project activities. Therefore, individual project impacts on wetlands should be minimized and mitigated according to federal and state requirements.

4.13.4 Vegetation

The total amount of vegetation that may be affected by all of the proposed or anticipated projects is substantial but still relatively small compared to the abundance of similar habitat in the region. Impacts resulting from construction of the pipelines would result in the long-term and permanent loss of non-herbaceous vegetation and would cause an incremental increase in fragmentation of forested and sagebrush areas. Timber harvesting and land development activities, particularly in the forested areas on the western end of the project in Oregon, also have resulted in the cumulative loss of forest habitat over the years. Sagebrush communities were once dominant in western North America. Wildfires, grazing by livestock, horses and burros, invasion of non-native plants, fragmentation by development (*e.g.*, roads, fences, power lines, and pipelines) and other activities have resulted in the cumulative loss of sagebrush-dominated areas over the years. Specifically, wildfires in Nevada from 1999 to 2007 have resulted in an approximate 2.5-million acre net loss of key sagebrush habitat (Espinosa and Phenix, 2008).

In the case of the Southwest Intertie Project, the power line could be designed to intersect the Ruby Pipeline Project at a point to minimize cumulative impacts on vegetation, including spanning the pipeline right-of-way and placing the transmission towers at the greatest distance from the right-of-way as possible. Because the Southwest Intertie Project would not require the removal of shrub-type vegetation

under the power lines, the cumulative impacts on vegetation at the point of intersection would be minimal.

The additive effects of present and future projects would continue a trend toward a reduction in these vegetative communities. This effect would be reduced to some extent by the collocation of proposed utilities with existing and proposed rights-of-way. Through the applicable permitting process, we expect that mitigation measures would be implemented for these projects to revegetate disturbed areas, increase the stabilization of site conditions, minimize potential for erosion, and in many cases control the spread of noxious weeds, thereby minimizing the degree and duration of the impact on vegetation from these projects and avoiding significant cumulative impacts.

4.13.5 Wildlife, Fisheries, and Special Status Species

Wildlife and Wildlife Habitat

Construction and operation of the Ruby Pipeline Project along with other projects mentioned in table 4.13-1 would incrementally add to the width of habitat discontinuities (for collocated projects) or otherwise contribute to habitat disturbance. Utility rights-of-way would fragment habitats where the utilities are not collocated with existing corridors, and construction of aboveground facilities would permanently remove habitat from the landscape. This would cause associated impacts on wildlife species as they adjust to the various projects' activities. Increased movement or displacement of species dependent on these habitats could reduce carrying capacities, reproductive effort, or survival. This potential is greater for species that have limited habitat in the project area or are otherwise more sensitive to disturbance. Livestock grazing in riparian areas (especially in the arid western United States) can cause immeasurable damage to riparian resources, including the loss of fish and wildlife habitat, soil erosion, and diminished water quality and quantity (Salvo, 2009). Some experts estimate that livestock grazing has damaged 80 percent of the streams and riparian ecosystems in the western United States (Belsky *et.al,* 1999). The removal of riparian ecosystems, woodlands and shrublands would result in a long-term reduction of wildlife habitat because the regeneration of woody species is typically slow in the region. The FWS has indicated energy development projects have degraded important sagebrush habitat, even when mitigation measures have been implemented.

The Southwest Intertie Project would intersect the Ruby Pipeline Project in Elko County, Nevada, in an area dominated by primarily sagebrush steppe and salt desert scrub habitat. The removal of shrublands would result in a long-term reduction of wildlife habitat because the regeneration of woody species is typically slow in the project region. However, construction of the two projects is not likely to result in significant cumulative impacts on wildlife given that the habitat types crossed are widely available for wildlife use outside of the immediate area of where the projects would intersect.

The amount of available winter range habitat would be reduced where projects are constructed within the same "range" habitat or geographic location. This generally occurs near the terminus of the project in Oregon. Big game habitat for elk and mule deer would be affected by the Ruby Pipeline Project and the Energy Gateway and Pacific Connector Pipeline projects, though not likely at the same time.

Establishment of structures for Ruby's communication towers and for new power line projects could increase impacts on birds as a result collisions with wires and pylons. The FWS has suggested and we have recommended that Ruby construct the communication towers in accordance with its *Guidance on the Siting, Construction, Operation and Decommissioning of Communications Towers*. The FWS also recommends that electric power lines be constructed in accordance with Edison Electric Institute's

Suggested Practices for Avian Protection on Power Lines – The State of the Art in 2006 (APLIC, 2006) and *Mitigating Bird Collisions With Power Lines: The State of The Art in 1994* (APLIC, 1994) to minimize impacts on birds. Electric power line facilities on federal lands would be subject to supplemental NEPA review. The electric transmission facilities may also be required to undergo an environmental review by state agencies.

The Draft Conservation Plan for greater sage-grouse and pygmy rabbit identifies projects that have been identified by each state to provide replacement or compensatory habitats for sage-grouse, pygmy rabbits, and other wildlife species. The types of projects under discussion include sagebrush-steppe restoration, riparian restoration, spring enhancement, conservation easements and land acquisition, rangeland reseeding, burn-area reseeding, invasive-weed control, livestock exclosures, fuels management, and research projects. These projects would reduce the threats posed by other projects, would have a long-term benefit for sage-grouse and pygmy rabbits, and would be cumulatively beneficial for these species both regionally and rangewide. The identified projects would provide replacement or compensatory habitats with a goal of "net zero impact." However, all projects and conservations measures would have to be 100 percent successful for this to occur. Since the projects and measures have not been implemented, the success rate cannot be determined. Based on past experience in implementing similar types of projects, the likelihood of success is high.

Projects would restore areas of degraded habitat and would protect habitat from future development and other uses (*e.g.*, grazing). Over the long term, sage-grouse and pygmy rabbits within the Project vicinity would benefit from the reduced threats of habitat loss and degradation. Fuel reduction projects in sagebrush would reduce the risk of large wildfires and would benefit various habitats and wildlife throughout the region. Research projects would contribute to a better understanding of sage-grouse and would cumulatively benefit the species rangewide; pygmy rabbit research projects, in particular, would contribute to a better understanding of pygmy rabbit biology, natural history requirements, and habitat impacts and would ultimately benefit the species rangewide.

In summary, we do not believe that construction of the Ruby Pipeline Project would result in significant cumulative impacts on wildlife, given that most of the project area is relatively open sagebrush, and habitat types crossed are widely available for wildlife use outside of the immediate area of project disturbance.

Fisheries and Aquatic Resources

Cumulative impacts on fisheries and aquatic resources could occur if multiple projects are constructed within the same stream segment and have similar construction timeframes. The only projects with the potential to occur within the same stream segment at the same time are the Energy Gateway Project, the Southwest Intertie Project, and the Upper Willow Creek Enhancement Project. The Energy Gateway Project and the Southwest Intertie Project, both electric power lines, would cross above two and three intermittent waterbodies, respectively, that also would be crossed by the Ruby Pipeline Project. Little or no work associated with the projects would be conducted in the streams themselves, except that construction equipment may bridge over or pass through the waterbody while travelling down the right-of-way. The Upper Willow Creek Enhancement Project is specifically aimed at enhancing the quality of Willow Creek for the Lahontan cutthroat trout through habitat improvement measures. Cumulative impacts associated with these projects would be short-term and minor, and in the case of the Upper Willow Creek Enhancement Project, beneficial. Cumulative impacts on fisheries from hydrostatic test water withdrawals are not anticipated as water withdrawals for the Ruby Pipeline Project and Pacific Connector Pipeline Project would not occur within the same watershed.

Special Status Species

The species discussed in section 4.7 of this EIS have the potential to be affected by construction and operation of the various projects discussed in this cumulative analysis. Ruby consulted with federal, state, and local agencies to determine which species may occur within its project area, evaluate potential impacts on those species as a result of construction and operation, and implement measures to avoid, minimize, or mitigate impacts on special status species and their habitats. Further, for each federally permitted project, the federal action agency would be required to complete its own separate Section 7 consultation.

Pygmy rabbit habitat was observed in the area where the project would intersect with the Southwest Intertie Project; two inactive greater sage-grouse leks were also documented. The species that occur in this area have the potential to be affected by construction and operation of the projects. Ruby is working with numerous agencies to develop conservation agreements to address potential project impacts on listed and other special status species. These efforts include development of a cooperative conservation agreement to specifically fund projects that would improve pygmy rabbit and greater sage-grouse habitat and conservation agreements to address ESA-listed species and migratory bird impacts. Because both the Southwest Intertie and Ruby projects would be required to restore their respective construction rights-of-way and adhere to all applicable laws and regulations regarding special status species and habitats, the cumulative impacts on special status species and their habitats are not likely to be significant.

The BLM's EA for three meteorological towers related to the China Mountain Wind Project analyzed the impacts on greater sage-grouse within 2- and 5-mile "buffer zones." Two of the proposed meteorological towers (M010 and M011) have buffer zones which contain greater sage-grouse leks and extend into Elko County, Nevada. The southern edge of the 5-mile buffer for the proposed new towers is 37.3 miles north of the Ruby project. The project's sponsors have conducted a number or surveys for greater sage-grouse leks and other indications of the presence of greater sage-grouse. Surveys discovered 40 documented greater sage-grouse leks within 5 miles of the proposed meteorological towers. The lek status for 24 of these sites is either inactive or unknown. There are five documented lek sites within 2 miles of the proposed towers, three of which are active near M012 and two that are inactive near M010 and M011. Preliminary observations during scat collection in 2008 showed 1 individual scat pellet and 1 scat cluster (more than 3 pellets together) at M010 and 119 scat pellets and 63 scat clusters at M011. Eighteen greater sage-grouse were flushed from an island of big sagebrush approximately 150 feet away from MO11. Although no active leks were documented near M011, there is evidence that greater sage-grouse use this area during certain periods of the year.

One tower for the China Mountain Wind Project has already been constructed (403) and one tower has been approved for construction (M103) in Elko County, Nevada. These towers are approximately 35 miles north of the proposed Ruby Pipeline Project right-of-way. Greater sage-grouse attendance of active leks following the first tower installation in 2002, and subsequent installations thereafter, has shown to be variable. No consistent patterns are readily visible, and these data are limited by a small sample size and limited years of monitoring following tower installation. Conclusions regarding whether the existing meteorological towers in the project area are displacing greater sage-grouse cannot be made from these data. The existing towers can directly impact greater sage-grouse by providing increased perching and nesting opportunities for raptors and corvids that prey upon greater sage-grouse and can increase the risk of greater sage-grouse collision with guy wire-supported structures. However, there have been no recorded greater sage-grouse injuries or mortalities associated with the existing meteorological towers.

Meteorological towers related to the China Mountain Wind Project are used to gather data to support turbine placement and would therefore be temporary. Habitat loss or alteration related to construction and operation of the meteorological towers would be short-term and localized in nature, as the proposed towers would be removed after 3 years of operation. Subsequent habitat restoration is expected to result in a no-net-loss of greater sage-grouse habitat over the long term. Visual and noise disturbance during the installation and removal processes would result in the temporary displacement of greater sage-grouse. Installation, operation, maintenance and decommissioning of the towers would be done using existing roads. A minor amount of habitat disturbance and potential displacement would take place while personnel are on site performing maintenance. The three proposed meteorological towers are not anticipated to have an additive greater sage-grouse injury or mortality effect, primarily because of their temporary nature (3 years). Due to the location of the meteorological towers in relation to the Ruby Pipeline Project, we anticipate that any cumulative impacts on the greater sage-grouse would be temporary and minor.

In summary, since most projects (especially those having federal or state permitting requirements) would be required to restore their respective construction rights-of-way and adhere to all applicable laws and regulations regarding special status species and habitats, we believe that the cumulative impacts on special status species and their habitats would not be significant.

4.13.6 Land Use and Visual Resources

Land Use

The majority of land use in the project area is undeveloped open land. That portion of any project with a permanent aboveground component, such as buildings, pavement, power poles, or stations, would have more significant impacts on land use than that portion of a project with an underground component because the aboveground component would preclude the use of the land for the foreseeable future. Underground components of any project would temporarily preclude use of the land during construction, but in many cases, land could revert to its preconstruction use after the facilities are built.

Notwithstanding the benefits of underground development, the underground facilities would still encumber the land with utility easements. The cumulative effect of multiple contiguous easements for underground facilities would be more apparent through forested areas than across open lands or agricultural areas. Multiple easements through open lands or agricultural areas would normally not impact the continued use of the land. That is, easements in open or agricultural areas typically continue in their function with little in the way of restrictions on the landowner. However, if the land in the easement was intended for a use other than open land, the landowner would face restrictions on structural development. Consequently, there would be some cumulative impact on landowners that are facing the addition of a new easement on their property.

New land requirements for the construction and operation of the Ruby project's aboveground facilities would involve the acquisition of about 221 acres for the four new compressor stations. Land requirements for all other aboveground facilities (MLVs, launcher/receiver facilities, and meter stations) total about 26 acres. Cumulatively, the Pacific Connector Pipeline Project's Tule Lake and Russell Canyon meter stations (the end delivery points of the Pacific Connector pipeline) would require about 7 acres of land for construction and operation in Klamath County, Oregon. Construction of the Pacific Connector pipeline would cumulatively add to the acreage of aboveground natural gas facilities in the general region.

Construction of the Southwest Intertie Project would cumulatively add to the acreage of industrial facilities in the area in the form of a small footprint from the footings for the power line towers. The

Southwest Intertie Project would also result in additional utility easements in the area. This project could be designed to intersect the Ruby Pipeline Project at a point to minimize cumulative impacts, including spanning the pipeline right-of-way and placing the transmission towers at the greatest distance from the right-of-way as possible.

Construction of the Energy Gateway Project and the two residential development projects would cumulatively add to the acreage of residential land and industrial facilities in the project area. The Ruby pipeline would be located near these projects around Brigham City, Utah. Ruby's aboveground facilities in this area include two MLVs and one launcher/receiver facility, which represents a small footprint (1.1 acres) added to the area encumbered by the footings for the power line towers and the residential developments.

The Ruby Pipeline Project would parallel an estimated 296.9 miles of road, power line, or pipeline rights-of-way. While installation of new pipelines parallel to existing corridors would incrementally reduce the area available for certain future developments, use of established utility corridors concentrates cumulative land use impacts. A further cumulative effect from the project is that it could increase the potential for an additional utility corridor to be sited along the pipeline route, as planning for a future linear project could look to follow the project as a way to reduce impacts by keeping disturbances within an existing corridor.

Although timber harvesting activities (particularly in forested areas in Oregon) have resulted in the loss of forest over the years, implementation of silvicultural actions in designated timber production areas on or near Ruby's route would not be considered a cumulative impact on land use because they are timber production projects in areas specifically designated for that purpose and their implementation would not convert or alter the designated future use of these areas. To minimize impacts on forest land uses from the Ruby project, all disturbed forest areas would be reforested, except for the 50-foot operational right-of-way, according to BLM and USFS requirements on federal lands and State of Oregon reforestation rules on private lands in Oregon.

No cumulative land use impact would occur between the Upper Willow Creek Enhancement Project area and the Ruby Pipeline Project as the pipeline corridor would revert to its pre-existing condition of open land, the same land use as the Upper Willow Creek Enhancement Project area.

Visual Resources

The projects listed in table 4.13-1 would have varying impacts on visual resources. Pipeline projects would have similar impacts as those discussed for the pipeline components of the Ruby Pipeline Project (see section 4.8.4). We do not expect a significant cumulative impact on visual resources from pipeline projects for the reasons discussed above (*e.g.*, collocation, restoration practices, and mitigation measures developed with the BLM and USFS where sensitive visual resource areas would be crossed).

Cumulative impacts on visual resources include the extent of the area from which the project would be visible. Visibility of the project may extend from 5 miles to the horizon. Past, present, and reasonably foreseeable projects that could cumulatively affect visual resources include the construction of the existing utilities (gas, overhead transmissions lines, and fiber optic lines), planned renewable energy projects like the China Mountain Wind Project, and the expansions of utilities such as the Energy Gateway and Southwest Intertie projects. The proposed project, when considered with these major aboveground, multiple-state projects would notably change the existing landscape characteristics of the area. These regional projects would contrast in terms of color, form, texture, and line and begin to spatially dominate the landscape, creating a substantially more altered landscape that would detract from the existing visual setting. Any project occurring on land owned by the federal government would

comply with the respective agency's visual resource management objectives. In complying with these management objectives, the potential visual impacts on the characteristic landscape would be reduced. Therefore, when considered along with past, present, and reasonably foreseeable future projects, the project would have a low cumulative impact on visual resources.

4.13.7 Socioeconomics

The Ruby Pipeline Project could result in cumulative socioeconomic impacts during both construction and operation. During construction, the estimated number of people who may relocate to the project area may result in a shortage of housing at certain locations during certain periods. We recognize that workers would be dispersed over the entire length of the pipeline route and throughout the counties crossed by the pipeline; however, based on our review of the information regarding availability of local rental housing for the project in Elko and Humboldt counties, Nevada, the combined number of non-local workers from the project alone may exceed the available housing in a given area. Ruby has proposed to address this possible housing shortage by establishing a construction camp near Vya, Nevada. Additionally, Ruby has proposed to establish a temporary housing facility in Lakeview, Oregon. The only other known projects in an area of low housing availability would be the Upper Willow Creek Enhancement Project, which does not have housing needs; and the China Mountain Wind Farm, which would likely be constructed in 2012 and would not overlap with Ruby's proposed construction schedule. Other projects would occur in areas where rental housing should be sufficient. Housing impacts, however pronounced, would be short-lived and limited to the approximate 10-month construction schedule, and would therefore not result in a long-term cumulative impact. Only 19 permanent employees would be associated with operation of the Ruby project.

It is unlikely that Ruby project-related traffic volumes would reach peak conditions at the same time and in the same location as another project. Construction in the vicinity of on-going mining activities near Elko and Winnemucca could result in a greater traffic impact in these areas. In addition, increased vehicle traffic from construction activity around the Vya Construction Camp and the Lakeview Temporary Housing Facility could cause traffic congestion and inconveniences. In particular, the Vya camp could inconvenience participants traveling to and from the Burning Man Festival, which is located 8 miles north of Gerlach, Nevada. While the project is sufficiently far enough away from the festival as to not cause a direct impact, the presence of construction traffic associated with the Vya camp could disturb access for those traveling to the Burning Man Festival on SR 34. To reduce these impacts, Ruby has agreed to work with Washoe County to mitigate traffic impacts by not scheduling any major shift changes in personnel during times when the majority of people are entering or leaving the Burning Man Festival. Ruby has committed to employ traffic monitors during the festival to ensure that construction traffic does not disturb access of festival attendees. In addition, Ruby would place signs on CRs 34 and 8A to alert drivers to the presence of construction-related traffic. Overall, any cumulative traffic impacts would be for a short period of time and would be coordinated with Ruby and local officials. During operations, the number of workers required to maintain pipeline facilities would be minimal, resulting in no significant additive impact on traffic levels. Therefore, we conclude that the project would not generate excessive traffic during construction or operations, and therefore would have little to no cumulative impact on traffic.

Ruby's expenditures for payroll, local purchases, and related tax revenues would provide a short-term beneficial impact on the affected counties during construction. We expect that similar benefits would be associated with the other projects in the vicinity. There may also be positive long-term cumulative impact tax revenue paid to the state and local governments over the life of the projects (including the Ruby Pipeline Project), particularly with the combination of the Southwest Intertie Project, China Mountain Wind Project, the Pacific Connector Pipeline Project, and the Energy Gateway Project. These positive cumulative impacts would serve to expand the tax bases of some of the rural counties

along the pipeline right-of-way and would provide the counties with locally generated funds and enable them to diversify their tax rolls.

4.13.8 Cultural Resources

There are a few areas where other projects would take place at the same location as the proposed project and may result in cumulative effects to cultural resources. The majority of the proposed Ruby pipeline corridor is not in the path of other ground-disturbing projects.

The eastern terminus of the Pacific Connector Pipeline Project is currently planned to be in the vicinity of the western terminus of the Ruby Pipeline Project near Malin, Oregon. The area around Malin is considered a feeder location for energy transmission facilities. There is a north/south pipeline as well as a steel tower power line and a wooden pole power line in the vicinity. The ground has been repeatedly disturbed at this location, and the cultural resources of the area have been previously studied. The presence of another energy project such as Ruby or Pacific Connector is not expected to have any significant cumulative effect to cultural resources. The situation is similar on the eastern end of the Ruby project near Opal, Wyoming. There are several energy transmission facilities near the project's eastern end, and the addition of another facility is not expected to have any meaningful cumulative effect.

The Energy Gateway Project, if constructed, would intersect with the Ruby Pipeline Project near Brigham City, Utah. New residential development is also planned for Brigham City, according to Box Elder County authorities. Ruby recorded several linear cultural properties in its 2008 survey of the project corridor near Brigham City. Depending on the location of the Energy Gateway Project and new housing developments, there could be a cumulative effect from construction projects on the linear cultural resources in and around Brigham City. Linear cultural sites recorded to date include a power line, historic canals, and a section of rail line. The significance of historic linear features lies in part in their integrity as a location that retains the look and feel of the original historic material and setting. If the material of the resources is compromised by pipeline construction and the viewshed affected by new housing, there could be a negative cumulative effect.

One known cultural resource site is within the immediate vicinity of the potential intersection of the Southwest Intertie Project and the Ruby Pipeline Project. However, because the span separation for a power line can range between 1,200 to 1,500 feet, the Southwest Intertie Project should be able to avoid impacts on this site. Thus, it is unlikely that the Southwest Intertie the Ruby projects would have significant cumulative impacts on cultural resources.

The BLM's Upper Willow Creek Enhancement Project is located in Elko County, Nevada, just north of the proposed Ruby Pipeline Project corridor. Nothing about the activities associated with the project (*e.g.,* topsoil preparation, seeding, watering) suggests that such restoration would contribute to cumulative effects to cultural resources. Federally regulated projects would be subject to Section 106 of the NHPA, which includes requirements for the identification of historic properties, as well as the determination of effects and the mitigation of impacts on them. Such a project would also require consultation with the appropriate SHPOs, Native American groups, and other parties.

4.13.9 Air Quality and Noise

<u>Air Quality</u>

Construction of the Ruby Pipeline Project, as well as past projects and reasonably foreseeable future projects listed in table 4.13-1, would involve the use of heavy equipment that would produce dust

from soil disruption and air contaminants from combustion emissions. All projects would follow state and local requirements for dust control on roads and excavated surfaces.

The majority of the construction effects of the Ruby Pipeline Project would be mitigated by the large five-state geographical area over which the various projects presented in table 4.13-1 are located, and the fact that these projects would be constructed over different periods. Construction- and operation-related air emissions are not expected to have significant impacts on air quality in the area. Because the projects listed in table 4.13-1 are located over a large area; have varying construction schedules; and must adhere to federal, state, and local regulations for the protection of ambient air quality, we do not expect significant cumulative impacts from construction.

On a regional airshed scale, cumulative increases in air pollutant emissions are not anticipated to be significant due to the minor source classification of all four compressor stations. All of the compressor stations and the Vya Construction Camp would be located in areas designated by the EPA as attainment or unclassifiable for the seven regulated criteria pollutants. Because the compressor stations and the Vya camp are minor sources and not subject to PSD requirements, long-range (airshed scale) modeling is not required under PSD.

Operation of the Ruby Pipeline Project, Gateway Energy Project, and Moxa Arch Area Infill Gas Development Project would contribute cumulatively to ongoing air emissions. Operation of the Southwest Intertie Project would contribute minimally to cumulative ongoing air emissions, and the sources of energy for transmission for the Southwest Intertie Project are proposed to be renewable energy projects.

On a local scale, cumulative increases in air pollutant emissions could occur where new compressor or pumping stations are sited at or near existing or proposed compressor stations. Each compressor station would be required to obtain state construction and operation permits, and potential interactions with nearby emission sources would be considered in these permit applications; therefore, we do not expect significant cumulative impacts.

Ruby's Roberson Creek Compressor Station in Wyoming would consist of three electric-driven compressors totaling 69,000 (ISO) hp, a natural gas-fired emergency generator, and natural gas-fired auxiliary heaters. The compressor station would not be an emission source, except when the emergency generator and auxiliary heaters would be used. Ruby's Wildcat Hills Compressor Station in Utah would consist of two natural gas-fired turbines totaling 28,668 (ISO) hp, a natural gas-fired emergency generator, and natural gas-fired auxiliary heaters. Ruby's Wieland Flat Compressor Station in Nevada would consist of two natural gas-fired turbines totaling 39,662 (ISO) hp, a natural gas-fired emergency generator, and natural gas-fired auxiliary heaters. Ruby's Desert Valley Compressor Station would consist of a natural gas-fired turbine at 19,831 (ISO) hp, a natural gas-fired emergency generator, and natural gas-fired auxiliary heaters. To minimize potential air quality impacts at the three natural gas-fired compressor stations, the compressor units would be equipped with low-NO_x control technology, and clean-burning natural gas would be utilized exclusively at the station. The compressor stations would be required to meet federal and state regulatory standards, and emissions associated with the compressor stations would be subject to air quality protection measures to ensure that air emissions remain at or below local, state, and federal emission standards for criteria air pollutants.

Ruby and its shippers have agreed to construct and operate the Ruby Pipeline Project as a carbon-neutral pipeline, which would be achieved through various methods such as design and operation considerations, the use of offsets, restoration, *etc*. This would minimize the cumulative impacts associated with air quality.

Noise

The Ruby Pipeline Project and those projects listed in table 4.13-1 may affect ambient noise levels during construction. Because construction proceeds as a moving assembly line along the pipelines, the duration of construction activities, and therefore noise impacts, at any one location would be limited to the short-term. Noise levels resulting from operation of the Ruby compressor stations would be minimal or not noticeable as the proposed facilities would be located in areas of low population density; thus, no significant cumulative impacts are expected. Based on the estimates presented in the acoustical analysis for the Ruby project, noise levels would remain below an L_{dn} of 55 dBA at any NSA.

Noise levels from operation of the nearby China Mountain Wind Farm turbines would also be minimal or not noticeable as the project would be in areas of low population density and a significant distance from the pipeline right-of-way; therefore, do not expect significant cumulative impacts.

4.13.10 Reliability and Safety

The Ruby Pipeline Project would be designed and constructed to meet or exceed the safety standards established in 49 CFR 192. The project would be built in accordance with regulations that govern material selection and qualification, minimum design requirements, location adjacent to roads and railroads, and protection from internal, external, and atmospheric corrosion. Other facilities would be subject to DOT, and/or other federal, state and local regulations as well. Ruby would support and actively participate in the one-call program in Wyoming, Utah, Nevada, and Oregon to provide preconstruction information to contractors or other maintenance workers on the underground location of pipes, cables, and culverts. Ruby would maintain liaison with appropriate fire, police, and public officials to define the resources and responsibilities of each emergency response organization and to coordinate mutual assistance in the event of a pipeline incident. Ruby also would establish a continuing education program to enable customers, the public, government officials, and those engaged in excavation activities to recognize a gas pipeline emergency and report it to appropriate public officials. Therefore, we do not believe there would be significant cumulative operational safety impacts among pipelines and other facilities located in the general vicinity of the proposed project.

4.13.11 Climate Change

A discussion of climate change impacts associated with the project was requested by multiple commenters on the draft EIS, including the EPA. Climate change is the change in climate over time, whether due to natural variability or as a result of human activity, and cannot be represented by single annual events or individual anomalies. For example, a single large flood event or particularly hot summer is not an indication of climate change, while a series of floods or warm years that statistically change the average precipitation or temperature over years or decades may indicate climate change.

The leading U.S. scientific body on climate change is the U.S. Global Change Research Program (USGCRP). Thirteen federal departments and agencies[13] participate in the USGCRP, which began as a presidential initiative in 1989 and was mandated by Congress in the Global Change Research Act of 1990. The USGCRP recently issued a report, *Global Climate Change Impacts in the United States*, which summarized the impacts that climate change has already had on the United States and what projected impacts climate change may have in the future (USGCRP, 2009). The report includes a breakdown of overall impacts by resource and describes impacts for various regions of the United States. Although

[13] The following departments comprise the USGCRP: EPA, DOE, Department of Commerce, Department of Defense, USDA, DOI, Department of State, DOT, Department of Health and Human Services, National Aeronautics and Space Administration, National Science Foundation, Smithsonian Institution, and Agency for International Development.

climate change is a global concern, we focus on the potential cumulative impacts of climate change in the project area for this cumulative analysis. The USGCRP's report notes the following observations of environmental impacts that may be attributed to climate change in the Northwest and Southwest United States:

- average temperatures have risen about 1.5° F over the past century and are projected to increase another 3 to 10° F during this century;
- droughts in arid and semi-arid areas are expected to increase in frequency and severity;
- drought stress and increased temperatures are projected to decrease tree growth in low and mid-elevation forests;
- summer moisture deficits are projected to increase the risk of forest fires (a pattern already being observed in recent decades); and
- shifts in the timing of runoff (towards an earlier streamflow) have been observed as much as 25 to 30 days earlier over the past 50 years, which lowers late summer flows (this shift, combined with increased rainfall instead of winter snowfall and warmer summers with increased evaporation, is projected to contribute to increased flood risks in the winter and increased drought risks in the summer).

The GHG emissions associated with construction and operation of the project are identified in Section 4.11.1.1. GHG emissions from the proposed project would not have any direct impacts on the environment in the project areas. Currently there is no standard methodology to determine how the project's relatively small incremental contribution of GHGs would translate into physical effects to the global environment. However, the emissions would increase the atmospheric concentration of GHGs, in combination with past and future emissions from all other sources, and would contribute incrementally to climate change that produces the impacts previously described.

Ruby proposes to be the first pipeline in the United States to construct and operate its project in a manner considered carbon neutral. In order to achieve carbon neutrality, Ruby has stated that it would incorporate a variety of design and operation considerations into the project, such as using internally coated pipe to improve hydraulic efficiency, following Green Building Council Leadership in Energy and Environmental Design criteria for buildings, reforestation, and/or purchase various financial instruments to offset Ruby's carbon production. Although we cannot accurately determine a project's incremental addition to the impacts of climate change on the environment, if Ruby is successful in its goal of carbon neutrality the project would not directly contribute to regional cumulative impacts on climate change.

4.13.12 Conclusion

The majority of cumulative impacts discussed above would be temporary and minor. However, long-term cumulative impacts on vegetation and land uses could occur if the other current and reasonably foreseeable future projects listed in table 4.13-1 are constructed and result in similar vegetation/land use impacts. Portions of projects with permanent aboveground components would have significant impacts on future land use, and construction of projects in the same vegetation types would result in the long-term and permanent loss of sagebrush and timber resources and an incremental increase in habitat fragmentation. Long-term cumulative benefits would be realized as a boost to the local economy associated with tax revenues. Short-term cumulative benefits would also be realized through jobs and wages and purchases of goods and materials.