

Appendix B
Corridor and Alternative Identification

Corridor and Alternative Identification

OEA's alternatives analysis followed a sequential process of first identifying corridors, then potential alignments within those corridors, and finally minor adjustments within those alignments that would avoid impacts. Two screenings were made, the first to evaluate and identify acceptable corridors and the second to evaluate alignments within the acceptable corridors.

B.1 Initial Screening by the Applicant

Washington Infrastructure Services prepared the *Central Utah Rail Feasibility Study* for the Applicant in December 2001 (Washington Infrastructure Services et al. 2001). This study presented the results of a preliminary investigation of four primary corridors in the study area that would meet the project's objectives. The Applicant's objectives were:

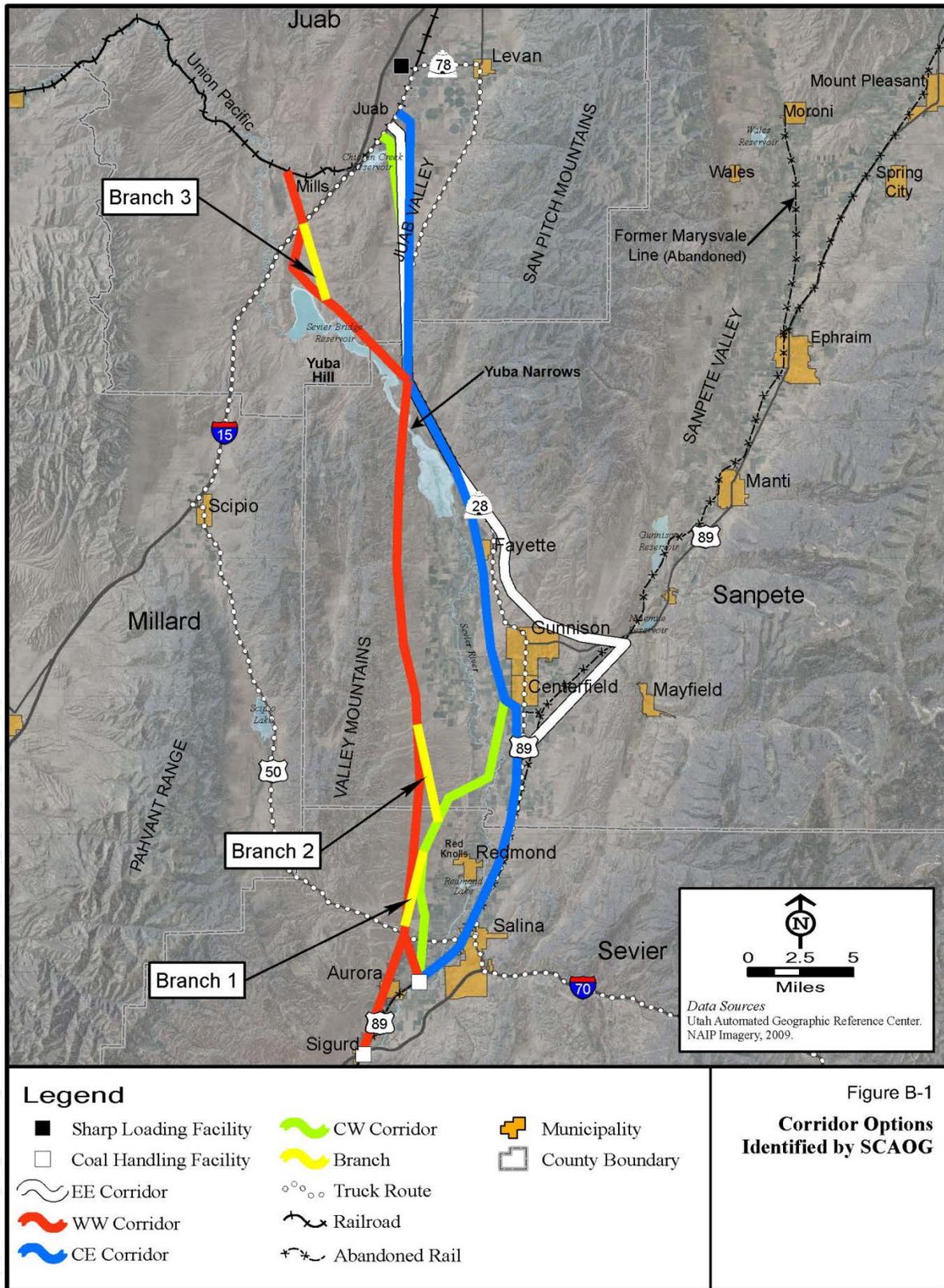
- Minimize impacts to wetlands and other environmental impacts
- Reduce coal-haul truck traffic through Salina and other communities
- Minimize disruption to private landowners
- Minimize the impact to irrigated farmland
- Meet rail shippers' and receivers' needs
- Optimize rail operations
- Minimize capital-improvement costs

The following four primary corridors were identified early in the review process (see Figure B-1 below):

- **WW** – This is the most westerly corridor. This corridor begins at Mills and runs southeasterly to the Yuba Reservoir, then south to a proposed coal-handling facility near Sigurd.
- **CW** – This is one of the two central corridors. This corridor begins at Juab and runs along the western side of the Sevier River Valley to a proposed coal-handling facility southwest of Salina.
- **CE** – This is one of the two central corridors. This corridor begins at Juab and runs along the eastern side of the valley to a proposed coal-handling facility southwest of Salina.
- **EE** – This is the most easterly corridor. This corridor begins at Juab and follows Corridor CE to the Yuba Reservoir, where it branches eastward to Gunnison. At Gunnison, the corridor turns southwest and follows U.S. 89 and an abandoned railroad right-of-way to Salina and a proposed coal-handling facility southwest of Salina.

Additions to these primary corridors south of Yuba Hill included two crossovers (Branches 1 and 2) between Corridors WW and CW and one parallel line referred to as Branch 3 off Corridor WW near Mills. Branch (Br) 1 allows Corridor WW to move over onto Corridor CW and stop at the Salina coal-handling facility. Branch 2 allows this same operation, only at a point farther south, and it also allows Corridor CW to move over onto Corridor WW and stop at the Sigurd coal-handling facility. These branches are shown in Figure B-1 below.

Figure B-1. Corridor Options Identified by SCAOG



Legend

- Sharp Loading Facility
- Coal Handling Facility
- ⋯ EE Corridor
- WW Corridor
- CE Corridor
- CW Corridor
- Branch
- ⋯ Truck Route
- Railroad
- - - Abandoned Rail
- ⊕ Municipality
- County Boundary

Figure B-1
**Corridor Options
 Identified by SCAOG**

Because all the alternatives considered in both the Draft EIS and this Supplemental Draft EIS converge at a common point at the Juab County–Sanpete County border (about 11 miles northwest of Fayette) near Yuba Hill, the project area was divided at this common point, which is shown on figures and maps as Yuba Hill (YH in tables). This division created two groups of corridors (north and south), and the alternatives were designed and referred to as northern and southern alternatives. The Applicant identified five alternatives in the North Corridor Group and 10 alternatives in the South Corridor Group. These 15 alternatives met the project’s objectives. The results of this process are shown in Table B-1 below.¹ These alternatives were screened according to their expected environmental effects, right-of-way requirements, conceptual capital and mitigation costs, and operational requirements.

The environmental resources and impacts considered in the screening were wetlands; prime farmland, unique farmland, and farmland of state importance; farmland fragmentation; grazing land impacts; noise and vibration; air quality; parks and recreation; geologic hazards; known hazardous waste sites; municipal wells; high groundwater; surface water; big-game habitat and movement corridors; threatened and endangered species; and cultural resources.

The conceptual capital and mitigation costs included right-of-way; earthwork and borrow; drainage; construction reclamation; fencing; bridges; grade-separated crossings; track works; road crossings; and engineering, construction management, and mobilization.

¹ For a detailed explanation and tabulation of the screening process, see the Applicant’s Feasibility Report, which is included in the Draft EIS as Appendix K.

Table B-1. Corridors Evaluated in the Feasibility Report	
Corridor Number and Route Description ^a	Reason(s) for Elimination
North Corridor Group	
1 Mills to Yuba Hill (YH) via Western-most corridor (WW)	Comparison of Corridor 1 to Corridor 1A: <ul style="list-style-type: none"> • Slightly longer than Corridor 1A (12.1 vs. 11.4 miles, respectively) • Requires more private land (137.4 vs. 121.5 acres) • Greater potential than Corridor 1A for farmland fragmentation • Potential for impact to the least chub • Conceptually higher mitigation costs (\$154,000 vs. \$123,000)
1A Mills to YH via Br3/WW	Carried forward to Application phase
2 Juab to YH via Central-West corridor (CW)	Carried forward to Application phase
3 Juab to YH via Central-East corridor (CE)	Comparison of Corridor 3 to Corridor 2: <ul style="list-style-type: none"> • Poor connection with UPRR line would lead to potential operating problems for UPRR and therefore much higher mitigation costs for the project • Corridor 3 is about 0.5 mile longer than Corridor 2, leading to higher overall construction cost • Greater impacts to private land (173.2 vs. 165 acres) • Slightly higher impacts to irrigated farmland (49.6 vs. 48 acres) and prime farmland (60 vs. 43 acres) • About 20 percent higher wetland impacts • Conceptual mitigation costs for Corridor 3 would be about \$300,000 higher than for Corridor 2
4 Juab to YH via Eastern-most Corridor (EE)	Comparison of Corridor 4 to Corridor 2: <ul style="list-style-type: none"> • Poor connection with UPRR line would lead to potential operating problems for UPRR and therefore much higher mitigation costs for the project • Greater impacts to irrigated land (67 vs. 48 acres) • About 20 percent higher wetland impacts • Conceptual mitigation costs for Corridor 4 would be about \$250,000 higher than for Corridor 2
South Corridor Group	
1-1 YH to N. Sigurd via WW/WW1	Carried forward to Application phase
1-2 YH to Salina via WW/WW2	Comparison of Corridor 1-2 to Corridor 1-1: <ul style="list-style-type: none"> • Greater impacts to prime farmland (68 vs. 46 acres) • Greater impacts to surface waters (8 minor crossings vs. 3; 2 major crossings vs. 1) • Relative severity of wetland impacts for Corridor 1-2 would be double that of Corridor 1-1
1A-1 YH to Sigurd via WW/Br2/Br1/WW1	Comparison of Corridor 1A-1 to Corridor 1-1: <ul style="list-style-type: none"> • Greater impacts to prime farmland (66 vs. 46 acres) • Greater impacts to surface waters (8 minor crossings vs. 3); both would have one major crossing (Yuba Reservoir) • Relative magnitude of wetland impacts for Corridor 1A-1 would be equal to that of Corridor 1-1

Table B-1. Corridors Evaluated in the Feasibility Report	
Corridor Number and Route Description ^a	Reason(s) for Elimination
1A-2 YH to Salina via WW/Br2/Br1/WW2	Comparison of Corridor 1A-2 to Corridor 1-1: <ul style="list-style-type: none"> • Greater impacts prime farmland (85 vs. 46 acres) • Greater impacts to surface waters (8 minor crossings vs. 3; 2 major crossings [Yuba Reservoir and Sevier River] vs. 1) • Relative magnitude of wetland impacts for Corridor 1A-2 would be double that of Corridor 1-1
1A-3 YH to Salina via WW/Br2/CW	Carried forward to Application phase
2 YH to Salina via CW	Carried forward to Application phase
2A-1 YH to N. Sigurd via CW/Br1/WW1	Comparison of Corridor 2A-1 to Corridor 2: <ul style="list-style-type: none"> • Greater impacts to public land (116.3 vs. 65.5 acres) • Greater impacts to private land (415.7 vs. 401.4 acres) • Greater impacts to irrigated farmland (153 vs. 143 acres) • Slightly fewer impacts to wetlands (50 vs. 52 acres)
2A-2 YH to Salina via CW/Br1/WW2	Comparison of Corridor 2A-2 to Corridor 2: <ul style="list-style-type: none"> • Greater impacts to public land (78.7 vs. 65.5 acres) • Slightly fewer impacts to private land (394.6 vs. 401.4 acres) • Greater impacts to irrigated farmland (154 vs. 143 acres)
3 YH to Salina via CE	Comparison of Corridor 3 to Corridor 2: <ul style="list-style-type: none"> • Fewer impacts to public land (53.3 vs. 65.5 acres) • Slightly fewer impacts to private land (400 vs. 401.4 acres) • Greater impacts to irrigated farmland (154 vs. 143 acres) • Greater impacts to big-game critical habitat (70 vs. 50 acres)
4 YH to Salina via EE	Comparison of Corridor 2A-1 to Corridor 2: <ul style="list-style-type: none"> • Much higher rail operational costs (and related air emissions and noise) due to rise and fall of alignment (350-foot rise/410-foot fall vs. 215-foot rise/265-foot fall) • Greater impacts to public land (146.9 vs. 65.5 acres) • Fewer impacts to irrigated farmland (116.5 vs. 143 acres) • Greater impacts to big-game critical habitat (70 vs. 50 acres)

Source: Washington Infrastructure Services et al. 2001

Shaded rows in the table indicate the corridors that were presented in SCAOG's application to the Board.

^a See Figure B-1 above for the locations of these routes.

B.2 Screening for the Draft EIS

For the Draft EIS, OEA considered two alternatives at the northern end of the project, identified in the Draft EIS as Alternatives N1 and N2, and five alternatives at the southern end of the project, identified as Alternatives S1, S2, S3, S4, and S5 (see Table B-2 and Figure B-2 below). These alternatives were evaluated to identify the advantages and disadvantages of each one and to identify the alternatives that would be carried forward for detailed review in the Draft EIS.

Alternatives N2 and S5 were carried forward in the Draft EIS, and this combined alternative was identified as Alternative B. Alternative B was the Applicant's Proposed Action in the Draft EIS. Alternative N2 was selected because UPRR had expressed the preference for a connection at the Juab siding and because this alternative would avoid the need for a new siding at Mills, would avoid excessive excavation west of I-15, and would avoid the need for a new railroad bridge to cross I-15. Alternative S5 was selected because it would avoid impacts to large wetland areas adjacent to and east of the Sevier River; would avoid residential and developed areas around Fayette, Gunnison and Centerfield; and would terminate at an existing industrial area southwest of Salina.

In the Draft EIS, OEA also considered Alternative C. This alternative was suggested by citizens who attended the public scoping meetings. This alternative follows the same route as Alternative B from the northern terminus to a point about 4.5 miles north of the Sanpete County–Sevier County border. At this point, Alternative C runs south on the west side of the Piute Canal, about 0.5 to 1.0 mile west of Alternative B but east of an existing high-voltage transmission line. Because Alternative C remains west of the Piute Canal, it also remains at a higher elevation on the foothills of the Valley Mountains than Alternative B toward the south end of the study area. Alternative C would be about 75 feet higher than Alternative B at their respective crossings of U.S. 50.

Thus, from U.S. 50 to the southern terminus, Alternative C would require a steeper grade than Alternative B. This steeper grade in turn would lead to more earthwork because a significant amount of fill would be needed to maintain a grade within acceptable engineering standards for freight railroads. The grade limitations in turn would lead to higher costs for land acquisition and structures and also to greater energy costs during operation.

The gradient challenges would also lead to a much larger footprint, especially at the southern end of the alternative. This in turn would cause greater impacts to farmland, wetlands, and other wildlife habitat areas. It would also create a large berm that would have significant visual impact west and southwest of Salina. The gradient would also require an additional grade-separated structure at U.S. 50.

For the reasons described above, Alternative C was eliminated from further study in this Supplemental Draft EIS.

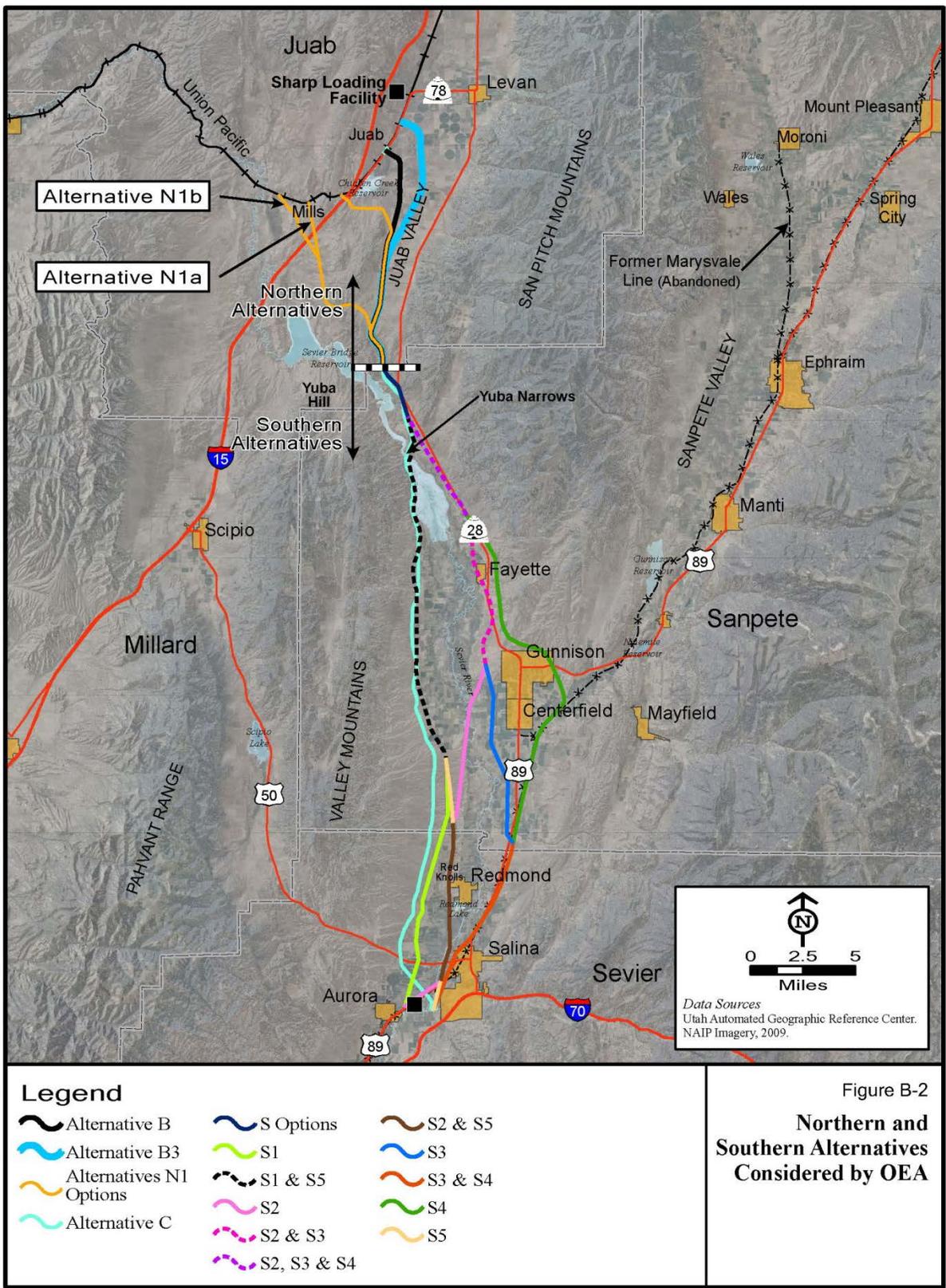
B.3 Alternatives for the Supplemental Draft EIS

Since the Draft EIS was issued, OEA identified three additional alternatives in response to questions raised by EPA and others in informal comments on the Draft EIS; these alternatives are referred to as Alternatives B1, B2, and B3 and are described in detail in Chapter 2, Proposed Action and Alternatives, of this Supplemental Draft EIS. These alternatives are in the same general corridor as the alternatives studied in the Draft EIS.

Table B-2. Summary Comparison of Alternatives for Draft EIS

Alternative	Advantages	Disadvantages
N1 - Connect at Mills	<ul style="list-style-type: none"> • Would avoid wetlands at Chicken Creek Reservoir • Would require less track than Alternative N2 	<ul style="list-style-type: none"> • Would require new siding and controls to UPRR mainline track • Would require excessive excavation (more than 70 feet for up to 1 mile) to meet track design criteria • Would have greater air and noise impacts during construction due to excavation • Would have increased operating costs due to steeper rail grades • Would require new railroad bridge over I-15 • Would fill Chicken Creek wetlands in area of new siding (less than 0.5 acre) • Would have potential to impact least chub
N2 - Connect at Juab	<ul style="list-style-type: none"> • Would have reduced construction impacts due to flatter grades • Would reduce impacts on air quality and ambient noise during operations due to flatter grades • Would avoid need for new railroad bridge crossing of I-15 • Would avoid need for new siding and control signals at UPRR mainline 	<ul style="list-style-type: none"> • Would fill about 1.5 acres of wetlands in vicinity of Chicken Creek Reservoir
S1	<ul style="list-style-type: none"> • Would avoid wetlands east of Sevier River • Area is generally less developed 	<ul style="list-style-type: none"> • Would require about 8 miles of additional track and right-of-way to connect with terminus at Sigurd • Would be farther from potential markets in Gunnison, Centerfield, and Redmond • Would have greater impacts to farmland
S2	<ul style="list-style-type: none"> • Would require less track and right-of-way • Would be closer to potential markets in Gunnison, Centerfield, and Redmond 	<ul style="list-style-type: none"> • Would require about 8 miles of additional track and right-of-way to connect with terminus at Sigurd • Would have greater impacts to farmland • Would impact more than 50 acres of wetlands along east side of Sevier River • Would have increased potential for noise impacts in Fayette and Gunnison
S3	<ul style="list-style-type: none"> • Would require less track and right-of-way • Would be closer to potential markets in Gunnison, Centerfield, and Redmond • Terminates at Salina 	<ul style="list-style-type: none"> • Would have greater impacts to farmland • Would impact more than 50 acres of wetlands along east side of Sevier River • Would have increased potential for noise impacts in Fayette and Gunnison
S4	<ul style="list-style-type: none"> • Would terminate at Salina • Portions would be located within abandoned rail right-of-way 	<ul style="list-style-type: none"> • Would impact more than 50 acres of wetlands along east side of Sevier River • Would have increased potential for noise impacts in Fayette and Gunnison
S5	<ul style="list-style-type: none"> • Would terminate at Salina • Would avoid wetlands east of Sevier River • Area is generally less developed 	<ul style="list-style-type: none"> • Would be farther from potential markets in Gunnison, Centerfield, and Redmond • Would fill about 11 acres of wetlands

Figure B-2. Northern and Southern Alternatives Considered by OEA



This page intentionally left blank.