

CHAPTER 3

Alternatives and Cumulative Projects

This section documents (1) the range of alternatives that was suggested and evaluated; (2) the approach and methods used to screen the feasibility of these alternatives according to guidelines established under CEQA; and (3) the results of the alternatives screening. This section is organized as follows: Section 3.1 is an overview of the alternatives screening process; Section 3.2 describes the methodology used for alternatives evaluation; Section 3.3 presents a summary of which alternatives have been selected for full EIR analysis and which have been eliminated based on CEQA criteria; Section 3.4 describes the alternatives that have been retained for full EIR analysis, including the No Project alternative; and Section 3.5 presents descriptions of each alternative that was eliminated from EIR analysis and explains why each was eliminated. Finally, Section 3.6 identifies and describes the other past, present, and reasonably foreseeable future projects that are considered in the cumulative impact analysis for this EIR.

3.1 Alternatives Development and Screening Process

One of the most important aspects of the environmental review process is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed project. In addition to mandating consideration of the No Project Alternative, CEQA Guidelines (Section 15126(d)) emphasize the selection of a reasonable range of technically feasible alternatives and adequate assessment of these alternatives to allow for a comparative analysis for consideration by decision makers. CEQA Guidelines state that the discussion of alternatives shall focus on alternatives capable of eliminating or reducing significant adverse environmental effects of a proposed project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly. However, CEQA Guidelines declare that an EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote or speculative.

Numerous alternatives to the Proposed Project were suggested during the scoping period (April 13 to May 15, 2007). Other alternatives were presented by PacifiCorp in its PEA, by the CPUC in Decision D.07-03-043, or developed by the EIR preparers. Particular emphasis was placed on developing feasible alternatives which would place the upgraded transmission line entirely within PacifiCorp's existing ROW.

In total, the alternatives screening process has culminated in the identification and screening of approximately 10 potential alternatives for PacifiCorp's proposed 115 kV transmission line

upgrade. These alternatives range from routing adjustments to undergrounding of the new transmission line. “Non-wires alternatives”¹ are addressed as well.

3.2 Alternatives Screening Methodology

The evaluation of alternatives to the proposed Yreka-Weed Transmission Line Upgrade Project, Southern Portion, was completed using a screening process that consisted of three steps:

Step 1: Clarify the description of each alternative to allow comparative evaluation.

Step 2: Evaluate each alternative using CEQA criteria (defined below).

Step 3: Determine the suitability of the each alternative for full analysis in the EIR. Infeasible alternatives and alternatives that clearly offered no potential for overall environmental advantage were removed from further analysis.

Following the three-step screening process, the advantages and disadvantages of the remaining alternatives were carefully weighed with respect to CEQA’s criteria for consideration of alternatives. These criteria are discussed in greater detail below.

CEQA Guidelines (Section 15126(a)) state that:

An EIR shall describe a reasonable range of alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project.

In order to comply with CEQA’s requirements, each alternative that has been suggested or developed for this project has been evaluated in three ways:

- Does the alternative meet most basic project objectives?
- Is the alternative feasible (legal, regulatory, technical)?
- Does the alternative avoid or substantially lessen any significant effects of the Proposed Project (including consideration of whether the alternative itself could create significant effects potentially greater than those of the Proposed Project)?

In addition to CEQA requirements regarding the alternatives screening methodology, the Commission, in D.07-03-043, ordered the assessment of “the environmental impacts of all the route options discussed” in D.07-03-043. This EIR meets that order. The environmental impacts of all routes at issue in that decision are either fully assessed in this EIR or are assessed to the extent that they can be appropriately screened out pursuant to the legal requirements of CEQA. Moreover, the alternatives discussed in D.07-03-043 that are excluded from further analysis due to the CEQA alternative screening analysis are along the same “route” as the alternatives that are retained for full CEQA analysis.

¹ “Non-wires alternatives” include methods of meeting project objectives that do not require major transmission lines (e.g., renewable energy supplies, conservation and demandside management, etc.).

3.2.1 Consistency with Project Objectives

CEQA Guidelines require the consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may “impede to some degree the attainment of project objectives” (Section 16126.6(b)). Therefore, it is not required that each alternative meet all of PacifiCorp’s objectives.

The objectives of the Proposed Project and the Weed Segment are defined by PacifiCorp in its PEAs (PacifiCorp, 2005 and 2007). This EIR does not adopt or endorse the objectives that PacifiCorp has defined for its Proposed Project or the Weed Segment PacifiCorp’s stated objectives are presented below.

PacifiCorp’s Proposed Project Objectives

- **Meet electric system demand** – to ensure that the system has adequate capacity to safely and reliably meet local and contractual electric system demand.
- **Ensure transmission system reliability** – to ensure the area transmission system meets planning criteria by providing an alternative transmission path in case of an outage of Line 14 between Hart Switching Station and Weed Junction by meeting Western Electricity Coordinating Council (WECC) N-1 Criteria (one line out of service).
- **Meet summer 2008 peak loads** – In order to meet this objective, construction must be started in the fall of 2007 as the ground may be too wet for construction in the spring.

PacifiCorp contends that construction of the Proposed Project is needed to complete the Yreka-Weed Transmission Line Upgrade Project, which would improve reliability by increasing transmission capacity in the Yreka-Weed area in order to continue safe and reliable electric service to customers in the area, and to meet PacifiCorp’s contractual obligations. Additionally, with the continued load growth in the area, Line 14 could be overloaded to the point that it would fail, resulting in a prolonged outage to the area while the line is rebuilt, thus not meeting Western Electricity Coordinating Council (WECC) N-1 Criteria (see Appendix B). Per Category B, Contingency 2 – for the single failure of a transmission line – thermal and voltage limits should not be exceeded, the system should be stable, and firm transfers should not be curtailed. A single failure of Line 14 would result in a failure to meet these criteria. PacifiCorp projects that Line 14 will reach its thermal limit in summer 2008, and will exceed its thermal limit in summer 2009.

PacifiCorp’s Weed Segment Objectives

- **Handle increased load** – increase the Weed Substation voltage from 69 to 115 kV and capacity from 12.5 MVA to 25 MVA.
- **Provide transmission capacity** – build a looped 115 kV transmission line extension to serve the Weed Substation thereby increasing capacity so that the load can be served.
- **Improve service reliability** – the 115 kV transmission loop would provide two transmission sources with capacity to feed the Weed Substation.

- **Meet summer 2008 peak loads** – In order to meet this objective, construction must be started in the fall of 2007 as the ground may be too wet for construction in the spring.

The Weed Substation is expected to be loaded to 13.15 MVA during the summer of 2008 which would exceed the existing 12.5 MVA transformer capacity by 5%. The overload is anticipated due to a 1.1 MVA industrial block load addition in 2006, combined with an annual load growth of about 350 KW. The 69 kV transmission system presently serving the Weed Substation is inadequate to support the additional load and capacity increase.

3.2.2 Feasibility

CEQA Guidelines (Section 15364) define feasibility as:

... capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

In addition, CEQA requires that the Lead Agency consider site suitability, economic viability, availability of infrastructure, general plan consistency, other regulatory limitations, jurisdictional boundaries, and proponent's control over alternative sites in determining the range of alternatives to be evaluated in the EIR (CEQA Guidelines Section 15126.6(f)). Feasibility can include three components:

- **Legal Feasibility:** Does the alternative have the potential to avoid lands that have legal protections that may prohibit or substantially limit the feasibility of permitting a 115 kV transmission line?
- **Regulatory Feasibility:** Does the alternative have the potential to avoid lands that have regulatory restrictions that may substantially limit the feasibility of, or permitting of, a 115 kV transmission line within a reasonable period of time?
- **Technical Feasibility:** Is the alternative feasible from a technological perspective, considering available technology; the construction, operation, and maintenance or spacing requirements of multiple facilities using common rights-of-way; and the potential for common mode failure?

For the screening analysis, the legal, technical, and regulatory feasibility of potential alternatives was assessed. The assessment was directed toward reverse reason; that is, a determination was made as to whether there was anything about the alternative that would be infeasible on technical, legal, or regulatory grounds.

This screening analysis does not focus on relative economic factors or costs of the alternatives (as long as they are found to be economically feasible) since CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may “impede to some degree the attainment of project objectives or would be more costly” (CEQA Guidelines Section 16126.6(b)).

3.2.3 Potential to Eliminate Significant Environmental Effects

CEQA requires that to be fully considered in an EIR, an alternative must have the potential to “avoid or substantially lessen any of the significant effects of the project” (CEQA Guidelines Section 16126.6(a)).

If an alternative was identified that clearly would not provide potential overall environmental advantage as compared to the Proposed Project, it was eliminated from further consideration. At the screening stage, it is neither possible, nor legally required, to evaluate all of the impacts of the alternatives in comparison to the Proposed Project with absolute certainty, nor is it possible to quantify impacts. However, it is possible to identify elements of an alternative that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area.

Table 3-1 presents a summary of the potential significant environmental effects of the Proposed Project. While, the Final Mitigated Negative Declaration (FMND) for the Proposed Project and Weed Segment (CPUC, 2006) concluded that there would be no significant environmental effects that could not be mitigated to a less than significant level, some design and construction details of the Weed Segment and the Southern Portion of the Proposed Project (the proposed actions being considered in this EIR) have been revised by PacifiCorp and may affect the EIR’s final significance determination. This impact summary was prepared using a liberal definition of “potentially significant” so as to avoid excluding alternatives that may provide some overall environmental benefit. This approach is also consistent with CPUC Decision 07-03-043, which directed that a range of alternatives be considered in this EIR.

Also, since this impact summary was prepared prior to completion of the EIR analysis, it may not be complete in comparison to the detailed analysis now presented in Section 4 of this EIR. However, the impacts in the Table 3-1 are representative of those resulting from preliminary EIR preparation and were therefore used to determine whether an alternative met CEQA Guidelines Section 16126.6(a) requirements.

3.3 Summary of Screening Results

Table 3-2 provides a composite list of the alternatives considered, and the results of the screening analysis with respect to the criteria findings for consistency with project objectives, feasibility and environmental effectiveness. Alternatives carried forward for full EIR analysis are listed below in Section 3.3.1. Alternatives eliminated from further consideration follow in Section 3.3.2. Of the several alternatives which would result in routing the upgraded transmission line within existing ROW, some were eliminated based on technical feasibility or failure to meet project objectives. However, variations of those alternatives were developed by the EIR team which meet project objectives, eliminate the technical feasibility issues, and follow the same alternative route entirely within the existing ROW.

**TABLE 3-1
SUMMARY OF PRELIMINARY SIGNIFICANT ENVIRONMENTAL IMPACTS
OF THE PROPOSED PROJECT AND THE WEED SEGMENT**

Issue Area	Impact
Aesthetics	<ul style="list-style-type: none"> • Degradation of the viewshed due to taller poles and modifications at the Weed Substation • Degradation of scenic views where no transmission line currently exists
Air Quality	<ul style="list-style-type: none"> • Construction dust or equipment exhaust emissions exceeding daily significance thresholds
Biological Resources	<ul style="list-style-type: none"> • Wetland and riparian habitat degradation • Increased risk of transmission line collision or electrocution for raptors and greater Sandhill cranes • Impacts to special status species (plants and wildlife) • Impact to nesting birds from construction activities such as tree trimming or removal could • Loss of habitat within the mule deer winter range from construction activities
Cultural Resources	<ul style="list-style-type: none"> • Construction disturbance to recorded and/or unknown cultural and historic resources
Hazards and Hazardous Materials	<ul style="list-style-type: none"> • Impacts to surface or groundwater from construction-related use of hazardous materials
Hydrology and Water Quality	<ul style="list-style-type: none"> • Degradation of water quality through sedimentation or construction-related erosion • Impacts to local groundwater wells and/or springs from pole installation or other construction-related activities
Land Use and Planning	<ul style="list-style-type: none"> • Potential inconsistencies with Policy 33 of the Siskiyou County General Plan
Noise	<ul style="list-style-type: none"> • Construction-related short-term noise impacts on sensitive land uses • Continuous operational noise from substations and/or transmission line corona
Transportation and Traffic	<ul style="list-style-type: none"> • Short-term closures or traffic controls on highways and roads during construction • Short-term construction interruption to pedestrian/bicycle/vehicular traffic, public transit, property access, and/or emergency response vehicles
Utilities and Service Systems	<ul style="list-style-type: none"> • Short-term utility interruptions due to contact with underground utilities during excavation or other ground disturbance

Figure 3-1 illustrates the general alignment of the six route alternatives compared to the Proposed Project and Weed Segment. Figure 3-2 is a “zoomed in” illustration of a representative segment of the alternative alignments and shows how the location and width of the ROW would vary between the alternatives. As is discussed in greater detail in the sections which follow, PacifiCorp Option 1 would expand the existing 50-foot ROW to 100 feet, PacifiCorp Option 4 would “shift” the ROW 15 feet to the north, while the Mackintosh Option 5, Option 4-ALJ3, and Mackintosh/ALJ Variations A and B would stay entirely within the existing 50-foot ROW.

3.3.1 Alternatives Analyzed in the EIR

The alternatives listed below are those that have been selected through the alternative screening process for detailed EIR analysis; the No Project alternative is also included as required by CEQA. Each of the route alternatives would substantially meet project objectives, would be feasible, and would avoid or reduce potential environmental effects of the Proposed Project. The alternatives are briefly described in Table 3-2 as well as in greater detail in Section 3.4.

- PacifiCorp Option 4
- Mackintosh/ALJ Variation A
- Mackintosh/ALJ Variation B
- No Project.

It is worth noting that the two Mackintosh/ALJ variations carried forward for full analysis draw substantially from the concepts first advanced in the “Mackintosh Option 5” and “Option 4-ALJ3” alternatives, which are discussed in CPUC Decision 07-03-043. While those two alternatives as originally described each have substantial project objective and or technical feasibility issues, they each do contain meaningful route variations which need to be evaluated in this EIR to meet the requirements of CEQA and the ordering paragraphs of CPUC Decision 07-03-043. As described in Section 3.4, the two Mackintosh/ALJ variations would follow essentially the same route as the original “Mackintosh Option 5” and “Option 4-ALJ3” alternatives but without the project objective or feasibility issues.

3.3.2 Alternatives Eliminated from EIR Consideration

The alternatives that have been eliminated through the alternative screening process from EIR analysis are listed below. As summarized in Table 3-2, these alternatives have been eliminated due to project objectives and feasibility concerns, and in some cases because the alternative would have greater environmental impacts than the Proposed Project. The rationale for elimination of each alternative is summarized in Table 3-2 and is described in greater detail in Section 3.5.

- PacifiCorp Option 1
- Mackintosh Option 5
- Option 4-ALJ3
- Undergrounding
- “Non-Wires” – Energy Conservation and Demand Side Management
- “Non-Wires” – Renewable Energy Resources.

TABLE 3-2
SUMMARY OF ALTERNATIVES SCREENING ANALYSIS
PACIFICORP YREKA-WEED TRANSMISSION LINE UPGRADE PROJECT, SOUTHERN PORTION

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria
<i>Passes Screening</i>			
PacifiCorp Option 4 <ul style="list-style-type: none"> • Shifts existing ROW 15 feet north • Construct new 115 kV double circuit pole line 15 feet north of existing 69 kV line • Move energized 69 kV and distribution to new poles • Remove old poles • “Release” 15 feet of ROW on south edge 	Meets all project objectives.	Meets feasibility criteria.	Meets environmental criteria, although some impacts may be similar to the Proposed Project but would occur in different locations. <u>Aesthetics</u> : would avoid establishing transmission line where one does not currently exist, but may incrementally degrade scenic views along Hwy 97 <u>Hydrology</u> : would avoid potential impacts to springs <u>Cultural</u> : may impact cultural site at Pole 11/47 <u>Biology</u> : would require tree trimming/removal to shift ROW 15 feet north
Mackintosh/ALJ Variation A <ul style="list-style-type: none"> • Entirely within existing ROW • Install temporary 115/69 kV transformer at Weed Sub • De-energize 69 kV line; distribution remains energized • Construct new 115 kV double circuit pole line with 69 kV and distribution on new poles; remove old poles as new are installed • Re-energize 69 kV line; remove temporary transformer 	Meets most project objectives	Meets feasibility criteria.	Meets environmental criteria, although some impacts may be similar to the Proposed Project but would occur in different locations. <u>Aesthetics</u> : would avoid establishing transmission line where one does not currently exist, but may incrementally degrade views along Hwy 97 <u>Hydrology</u> : would avoid potential impacts to springs <u>Cultural</u> : may impact cultural site at Pole 11/47 <u>Biology</u> : would require minimal tree trimming/removal inside ROW
Mackintosh/ALJ Variation B <ul style="list-style-type: none"> • Entirely within existing ROW • Construct temporary “shoo-fly” pole line for existing 69 kV and distribution lines • Move energized 69 kV and distribution lines to temporary poles • Construct new 115 kV double circuit pole line on ROW centerline • Move 69 kV and distribution to new pole line • Remove temporary poles 	Meets most project objectives	Meets feasibility criteria.	Meets environmental criteria, although some impacts may be similar to the Proposed Project but would occur in different locations. <u>Aesthetics</u> : would avoid establishing transmission line where one does not currently exist, but may incrementally degrade views along Hwy 97 <u>Hydrology</u> : would avoid potential impacts to springs <u>Cultural</u> : may impact cultural site at Pole 11/47 <u>Biology</u> : would require some tree trimming/removal outside ROW

TABLE 3-2 (Continued)
SUMMARY OF ALTERNATIVES SCREENING ANALYSIS
PACIFICORP YREKA-WEED TRANSMISSION LINE UPGRADE PROJECT, SOUTHERN PORTION

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria
Fails Screening			
PacifiCorp Option 1 <ul style="list-style-type: none"> • Expands existing ROW 50 feet north • Construct new 115 kV double circuit pole line 50 feet north of existing 69 kV line • Existing 69 kV and distribution lines remain in place on existing poles • Results in two sets of poles in a 100-foot ROW 	Meets project objectives.	Meets feasibility criteria.	Fails environmental criteria. <u>Aesthetics</u> : would avoid establishing transmission line where one does not currently exist, but would incrementally degrade views along Hwy 97 by adding a second set of poles and doubling the ROW <u>Hydrology</u> : would avoid potential impacts to springs <u>Cultural</u> : may impact cultural site at Pole 11/47 <u>Biology</u> : would require substantial tree trimming/removal to expand ROW 50 feet north, resulting in substantially greater impact than Proposed Project
Mackintosh Option 5 <ul style="list-style-type: none"> • Entirely within existing ROW • Modify the Weed Substation to permanently include either a new 115/69 kV transformer, or a single 3-wire 115/69/12 kV transformer • De-energize and abandon 69 kV line; distribution remains energized • Construct new 115 kV single circuit line with distribution on existing poles • Operate entire system at 115 kV 	Fails. Would degrade system reliability because Weed Substation would lose its ability to provide support to Line 2 at 69 kV.	Fails to meet technical feasibility. The 115 kV line would not meet minimum ground clearance, circuit separation, and wind and ice loading criteria if installed on existing poles, which would violate CPUC GO 95.	Meets environmental criteria, although some impacts may be similar to the Proposed Project but would occur in different locations. <u>Aesthetics</u> : would avoid establishing transmission line where one does not currently exist, but may incrementally degrade views along Hwy 97 due to large expansion of the Weed Substation <u>Hydrology</u> : would avoid potential impacts to springs <u>Cultural</u> : may impact cultural site at Pole 11/47 <u>Biology</u> : would require minimal tree trimming/removal inside ROW
Option 4-ALJ3 <ul style="list-style-type: none"> • Entirely within existing ROW • Modify the Weed Substation to permanently include either 115/12 kV and 115/69 kV transformers, or a single 3-wire 115/69/12 kV transformer • De-energize 69 kV line; distribution remains energized • Construct new 115 kV double circuit pole line with 69 kV and distribution on new poles; remove old poles as new are installed • Re-energize 69 kV line 	Fails. Lead time for procurement of new transformers is a minimum of 15 months. This would delay completion of construction into mid-summer 2009 or later, which would be past the estimated time when Line 14 will exceed its thermal limit. In this event, PacifiCorp would fail to meet WECC N-1 Criteria, thus creating a risk of prolonged outage to the area. This would fail to meet all three project objectives.	Meets feasibility criteria. Although use of a 3-wire 115/69/12 kV transformer is technically infeasible, adding separate 115/69 kV transformers is feasible.	Meets environmental criteria, although some impacts may be similar to the Proposed Project but would occur in different locations. <u>Aesthetics</u> : would avoid establishing transmission line where one does not currently exist, but may incrementally degrade views along Hwy 97 due to expansion of the Weed Substation and taller poles in the ROW <u>Hydrology</u> : would avoid potential impacts to springs <u>Cultural</u> : may impact cultural site at Pole 11/47 <u>Biology</u> : would require minimal tree trimming/removal inside ROW

TABLE 3-2 (Continued)
SUMMARY OF ALTERNATIVES SCREENING ANALYSIS
PACIFICORP YREKA-WEED TRANSMISSION LINE UPGRADE PROJECT, SOUTHERN PORTION

Alternative	Project Objectives Criteria	Feasibility Criteria	Environmental Criteria
<p>Undergrounding</p> <ul style="list-style-type: none"> Replace the easterly segment of the proposed project with an underground transmission line 	<p>Fails. Substantial schedule delays due to difficult soil conditions and other physical constraints would delay completion of construction into mid-summer 2009 or later, which would be past the estimated time when Line 14 will exceed its thermal limit. In this event, PacifiCorp would fail to meet WECC N-1 Criteria, thus creating a risk of prolonged outage to the area. This would fail to meet all three project objectives.</p>	<p>Meets feasibility criteria.</p>	<p>Fails environmental criteria. <u>Aesthetics</u>: would avoid establishing transmission line where one does not currently exist <u>Hydrology</u>: would substantially worsen potential impacts to springs, surface water, and groundwater <u>Cultural</u>: would substantially increase the likelihood of impacting both known and unknown cultural resources <u>Biology</u>: construction would impact substantially more ground surface than the Proposed Project, potentially resulting in significant permanent impacts to wetlands and special status species <u>Air Quality</u>: would result in substantially greater air emissions during construction <u>Noise and Vibration</u>: would result in potentially significant impacts during construction from drilling and blasting</p>
<p>Non-Wires – Energy Conservation and Demand Side Management</p> <ul style="list-style-type: none"> Replace need for transmission line upgrade through implementation of energy conservation programs 	<p>Fails. Would not provide either the capacity or reliability needs of PacifiCorp, as stated in their objectives for the Proposed Project. Furthermore, without completing the Line 1 upgrade to 115 kV, the Weed Segment could not be built, thereby failing to meet the objectives of that project.</p>	<p>Fails. These programs are not feasible on a scale that would be suitable to replace the Proposed Project within a reasonable period of time.</p>	<p>Meets environmental criteria. Complete avoidance of the Proposed Project would eliminate the potential environmental impacts of the construction and operation of the transmission line and substation upgrade, and no new significant impacts would be created.</p>
<p>Non-Wires – Renewable Energy Resources</p> <ul style="list-style-type: none"> Provide local sources of renewable energy that would not require upgrade of the transmission line or substation 	<p>Fails. There is limited potential for local renewable resources to meet the capacity and reliability needs of PacifiCorp, as stated in the objectives for the Proposed Project.</p>	<p>Fails. Because even local renewable resources would require upgraded or new transmission infrastructure, this alternative is not technically feasible without the Proposed Project or some similar local infrastructure upgrades.</p>	<p>Fails. Large scale geothermal, wind, or solar facilities would potentially result in greater environmental impacts for aesthetics and biological resources, and would occur in addition to the impacts from upgraded transmission infrastructure.</p>

3.4 Alternatives Evaluated in this EIR

3.4.1 PacifiCorp Option 4

Description

This alternative would include upgrading the existing 69 kV line from Pole 15/44 south to Pole 8/45 as described under the Proposed Project. At Pole 8/45 the 115 kV single circuit line would continue south with pole-for-pole replacement to Pole 19/45, where the alignment would veer east parallel to, but 15 feet north of, an existing 69 kV line generally along Highway 97 until reaching Pole 14/48 (approximately 1.4 miles). From Pole 14/48 into the Weed Junction Substation (approximately 0.3 mile), the route would be essentially the same as for the Proposed Project, except that the pole alignment would be 15 feet north of the existing poles rather than 15 feet south. The alignment of this alternative is shown in Figure 3-1.

Pole 19/45 for this alternative would be a custom steel structure with a concrete foundation similar to what Pole 8/45 would be under the Proposed Project. In the existing ROW between Poles 10/47 and Pole 1/49 at the Weed Junction Substation (approximately 33 poles total), new wood poles up to 24 inches in diameter would be installed approximately 15 feet directly north of each existing pole in the 69 kV ROW, thus requiring an additional 15-foot ROW easement. Once the new poles are installed, the existing 69 kV line and distribution underbuild would be swung over to the new poles, and the existing poles would be removed. Once the old poles are removed, 15 feet of the easement on the southern edge would be “released”, so that the total easement would remain at 50 feet but shifted 15 feet to the north. The new poles would be approximately 10 to 30 feet taller than the existing poles. The 4 poles at the Weed Junction Substation would be essentially the same for this alternative as they would be under the Proposed Project; Appendix C provides a detailed listing of the pole types and heights.

Under this alternative, the Weed Segment double circuit 115 kV line “loop” would begin at Pole 19/45 and proceed south to the Weed Substation rather than beginning at Pole 8/45 under the Proposed Project. The 11 poles from 8/45 to 18/45 (approximately 0.5 mile) would be single circuit 115 kV poles instead of double circuit, and so would be approximately 5 to 10 feet lower in height than they would under the Proposed Project. The double circuit line from 19/45 south and the rebuild of the Weed Substation would be the same under this alternative as it would under the Proposed Project.

Temporary disturbance for structure work areas would be the same under this alternative as for the Proposed Project on a per-pole basis. The total number of work areas for pole installation and removal would be slightly higher under this alternative, as there would be approximately 12 more new poles (14 more wood poles and 2 fewer steel poles) compared to the total under the Proposed Project and Weed Segment. Approximately 5 more tangent structure work areas (i.e., at Poles 1/48, 2/48, 3/48, 11/48 and 12/48) would require site preparation and grading under this alternative compared to the Proposed Project. The average tangent structure work area would be approximately 5,000 square feet, so the 5 additional disturbed areas for this alternative would

result in approximately 25,000 square feet (0.6 acres) greater disturbance. The total permanent footprint for poles under this alternative would be approximately 20 square feet greater than for the Proposed Project and Weed Segment. Table 3-3 summarizes the pole installation metrics for this alternative.

**TABLE 3-3
SUMMARY OF TYPICAL POLE INSTALLATION METRICS
FOR THE PROJECT WITH PACIFICORP OPTION 4 ALTERNATIVE**

	Project with PacifiCorp Option 4 115 kV Single-circuit Transmission Line (approximate metrics)	Weed Segment 115 kV Double-circuit Transmission Line (approximate metrics)
Pole Diameter		
- Wood	24 inches	24 inches
- Self Supporting Steel	48 inches	48 inches
Auger Hole Depth		
- Wood	9 to 11 feet	9 to 12 feet
- Self Supporting Steel	20 to 25 feet	20 to 30 feet
Permanent Footprint per Pole		
- Wood	3.14 sq. feet	3.14 sq. feet
- Self Supporting Steel	12.56 sq. feet	12.56 sq. feet
Number of Poles		17
- Wood	61	3
- Self Supporting Steel	2	
Average Work Area around Pole (e.g., for old pole removal and new pole installation)		
- Tangent structure work areas	5,000 sq. feet	5,000 sq. feet
- Dead End/Angle structure work areas	5,400 sq. feet	5,400 sq. feet
Total Permanent Footprint for Poles	Approximately 0.005 acres	Approximately 0.001 acres

Pull/tension sites under this alternative would not be substantially different in total area of disturbance, but would occur in different locations than under the Proposed Project. Under this alternative, the pull/tension site at Pole 8/45 would be smaller than under the Proposed Project because there would be no pull required toward the east. Pull/tension sites would be required at Poles 19/45 and 5/48 for this alternative, as shown on Figure 3-1.

Access road requirements for this alternative are illustrated on Figure 3-1, and are summarized in Table 3-4 below. Compared to the Proposed Project, disturbance for road areas for this alternative (including the Weed Segment) would increase by approximately 1.38 acres for Existing and 0.08 acres for New Permanent. Disturbance for Overland Access would decrease by approximately 1.55 acres.

**TABLE 3-4
SUMMARY OF ACCESS ROAD REQUIREMENTS
FOR THE PROJECT WITH PACIFICORP OPTION 4 ALTERNATIVE**

Type of Road	Description	Area ^a for Project with PacifiCorp Option 4	Area ^a Weed Segment
Existing	Typically double track. May have been graded previously. No other preparation required, although a few sections may need to be re-graded and crushed rock applied in very limited areas for traction.	5.13 acres	0.78 acres
New Permanent	Would be 12 feet wide, bladed. No other preparation required although crushed rock may need to be applied in very limited areas for traction.	0.09 acres	0.06 acres
Overland Access	No preparation required. Typically grassy areas that are relatively flat. No restoration would be necessary.	1.76 acres	0.13 acres

^a Based on typical road width of 12 feet.

Vegetation clearance would be greater for this alternative than for the Proposed Project. The existing ROW passes through mature stands of conifers and other types of vegetation for most of the approximately 1.4 miles from Pole 19/45 to Pole 14/48. Shifting the ROW 15 feet to the north in this area would require trimming and removal of trees for line clearance requirements, and trimming or clearing of lower vegetation for fire safety requirements. The exact number and location of trees that would have to be removed by shifting the ROW 15 feet to the north would be determined during final surveying and engineering design, but would likely include between 20 to 50 trees larger than 10 inches diameter at breast height (dbh) with some in excess of 30 inches dbh (based on field observations noted by ESA biologists for the Constraints Analysis conducted for the Mitigated Negative Declaration (Appendix A in CPUC, 2006)).

Construction workforce, equipment, and methods for this alternative would be essentially the same as described for the Proposed Project. The poles between 10/47 and 1/49 would be wood poles direct embedded to a depth of approximately 9 to 11 feet. Because this is a high wind area, storm guys (one guy wire anchored on each side of a pole perpendicular to the direction of the transmission line) would generally be required between Poles 13/47 to 12/48 (approximately 23 poles total). Span guys across Highway 97 to a stub pole would be required for Pole 5/48, as is the case for the existing pole at that location. However, because the new pole at 5/48 would be taller than the existing pole, the new pole would require 7 span guys rather than 4 for the existing pole. Also, the stub pole on the south side of Highway 97 would need to be approximately 20 feet taller than the existing stub pole.

PacifiCorp estimates that this alternative would take approximately 10 months to construct, as shown in Table 3-5 below.

**TABLE 3-5
PROPOSED CONSTRUCTION SCHEDULE
FOR THE PROJECT WITH PACIFICORP OPTION 4 ALTERNATIVE**

Project Activity	Project with PacifiCorp Option 4	Weed Segment
Permit To Construct decision adopted and effective	October 2007	October 2007
Acquisition of required permits	August 2006 – April 2007	February 2006 – October 2007
Right-of-way / property acquisition	November 2006 – April 2008	August 2007 – November 2007
Final engineering completed	January 2008	September 2007
Construction begins	May 2008	November 2007
Transmission line construction	May 2008 – July 2008	February 2007 – May 2008
Temporary Substation Construction	N/A	November 2007 – December 2007
Substation construction	N/A	November 2007 – May 2008
Project operational	August 2008	June 2008
Clean up	August 2008 – October 2008	May 2008 – September 2008

Rationale for Full Analysis

Project Objectives

This alternative would meet all project objectives.

Feasibility

This alternative would meet all legal, regulatory, and technical feasibility criteria. Additional ROW easements would have to be negotiated with approximately five property owners to shift the existing ROW 15 feet to the north. However, PacifiCorp can choose to pursue legal condemnation should negotiations fail to result in equitable agreements.

Lessen Significant Environmental Impacts

This alternative would avoid any degradation of aesthetic resources or potential impacts to groundwater that may occur along the 1.4-mile segment of the Proposed Project between Poles 8/45 and new Pole 1.

Potential New Impacts Created

This alternative would result in shifting the existing ROW to the north by 15 feet for approximately 1.7 miles. The existing ROW passes through mature stands of conifers and other types of vegetation for most of the approximately 1.4 miles from Pole 19/45 to Pole 14/48. Shifting the ROW 15 feet to the north in this area would require trimming and removal of trees for line clearance requirements, and trimming or clearing of lower vegetation for fire safety requirements. Because some of the trees potentially requiring removal would be larger than 10

inches diameter at breast height (dbh), with some in excess of 30 inches dbh, this may worsen potential impacts to biological resources compared to the Proposed Project. Also, the Highway 97 corridor along which portions of this alternative route would follow is part of the Volcanic Legacy Scenic Byway and a designated All American Road. The taller poles and heavier conductor required for this alternative may result in degradation of scenic views to residents and visitors traveling Highway 97. And finally, a recorded cultural (historic and prehistoric) resource is known to occur in the vicinity of Pole 11/47 and may be impacted by construction activities for this alternative. However, at the screening stage these potential impacts are not defined sufficiently to eliminate this alternative from further consideration.

3.4.2 Mackintosh/ALJ Variation A

Description

This alternative was developed by the EIR team to achieve construction of the transmission line upgrade entirely within PacifiCorp's existing ROW but without the technical and schedule constraints of the Option 4-ALJ3 and Mackintosh Option 5 alternatives. Similar to the PacifiCorp Option 4 alternative, this alternative would upgrade the existing 69 kV line from Pole 15/44 south to Pole 8/45 as described under the Proposed Project. At Pole 8/45 the 115 kV single circuit line would continue south with pole-for-pole replacement to Pole 19/45, where the alignment would veer east within an existing 69 kV line ROW following generally along Highway 97 until reaching the Weed Junction Substation (approximately 1.7 miles). The alignment of this alternative is shown in Figure 3-2.

For this alternative, a temporary 115/69 kV transformer of approximately 20 MVA capacity would be required at the Weed Substation to serve existing load to Weed and the International Paper substation. Once the temporary transformer is installed and operational, the 69 kV line between the Weed and Weed Junction Substations could be de-energized, thus allowing construction of the new double circuit line in the centerline of the existing ROW. The existing distribution underbuild in the ROW would need to remain energized to serve local residents; however, PacifiCorp has stated that construction of the new line could occur safely with the distribution lines energized.

Pole 19/45 for this alternative would be a custom steel structure similar to what Pole 8/45 would be under the Proposed Project. In the existing ROW between Poles 10/47 and Pole 1/49 at the Weed Junction Substation (approximately 33 poles total), the existing poles would be removed and new wood poles up to 24 inches in diameter would be installed on the existing ROW centerline within approximately 10 feet of the existing pole location. The new poles would then be strung with new 115 kV conductor, plus the existing 69 kV line and distribution underbuild. The final result of this alternative would be a double circuit pole line in the center of the existing ROW with 115 kV, 69 kV, and distribution underbuild. The new double circuit poles would be approximately 10 to 30 feet taller than the existing poles, but in essentially the same location as the existing poles along that 1.7-mile segment. The pole types and heights for this alternative would be essentially the same as those listed in Appendix C for the PacifiCorp Option 4 alternative.

Under this alternative, the Weed Segment double circuit 115 kV line “loop” would begin at Pole 19/45 and proceed south to the Weed Substation rather than beginning at Pole 8/45 under the Proposed Project. The 11 poles from 8/45 to 18/45 (approximately 0.5 mile) would be single circuit 115 kV poles instead of double circuit, and so would be approximately 5 to 10 feet lower in height than they would under the Proposed Project. The double circuit line from 19/45 south and the rebuild of the Weed Substation would be the same under this alternative as it would under the Proposed Project.

Temporary disturbance for structure work areas would be the same under this alternative as for the Proposed Project on per-pole basis. The total number of work areas for pole installation and removal would be slightly higher under this alternative, as there would be approximately 12 more new poles (14 more wood poles and 2 fewer steel poles) compared to total under the Proposed Project and Weed Segment. Approximately 5 more tangent structure work areas (at Poles 1/48 to 3/48 and 11/48 to 12/48) would require site preparation and grading under this alternative compared to the Proposed Project. The average tangent structure work area would be approximately 5,000 square feet, so the 5 additional disturbed areas for this alternative would result in approximately 25,000 square feet (0.6 acres) greater disturbance. The total permanent footprint for poles under this alternative would be approximately 20 square feet greater than for the Proposed Project and Weed Segment. Table 3-6 summarizes the pole installation metrics for this alternative.

**TABLE 3-6
SUMMARY OF TYPICAL POLE INSTALLATION METRICS
FOR THE PROJECT WITH MACKINTOSH/ALJ VARIATION A ALTERNATIVE**

	Project with Mackintosh/ALJ Variation A 115 kV Single-circuit Transmission Line (approximate metrics)	Weed Segment 115 kV Double-circuit Transmission Line (approximate metrics)
Pole Diameter		
- Wood	24 inches	24 inches
- Self Supporting Steel	48 inches	48 inches
Auger Hole Depth		
- Wood	9 to 11 feet	9 to 12 feet
- Self Supporting Steel	20 to 25 feet	20 to 30 feet
Permanent Footprint per Pole		
- Wood	3.14 sq. feet	3.14 sq. feet
- Self Supporting Steel	12.56 sq. feet	12.56 sq. feet
Number of Poles		
- Wood	61	17
- Self Supporting Steel	2	3
Average Work Area around Pole (e.g., for old pole removal and new pole installation)		
- Tangent structure work areas	5,000 sq. feet	5,000 sq. feet
- Dead End/Angle structure work areas	5,400 sq. feet	5,400 sq. feet
Total Permanent Footprint for Poles	Approximately 0.005 acres	Approximately 0.001 acres

This alternative would involve installing a temporary 115/69 kV transformer, transformer protection, and 69 kV circuit breaker at the Weed Substation. This equipment would require construction of a temporary pad area approximately 50 feet by 100 feet (5,000 square feet) which would need to be located outside of the Weed Substation footprint to allow room for the rebuild of the Weed Substation as described for the Weed Segment. Site preparation for the temporary pad area would likely require grading, import of crushed rock, installation of a ground grid, and installation of temporary fencing. These activities would be in addition to, but similar in nature as, the temporary substation construction described as part of the Weed Segment. Subsequent to completion of the line upgrade, the temporary transformer and related equipment would be removed and the temporary pad restored as described for the Weed Segment activities.

Pull/tension sites under this alternative would not be substantially different in total area of disturbance, but would occur in different locations than under the Proposed Project. Under this alternative, the pull/tension site at Pole 8/45 would be smaller than under the Proposed Project because there would be no pull required toward the east. Pull/tension sites would be required at Poles 19/45 and 5/48 for this alternative, as shown on Figure 3-2.

Access road requirements for this alternative would be similar to those for the PacifiCorp Option 4 alternative, but would be slightly shorter in overall length. The shorter overall length would occur because access would not be required to both the centerline and the edge of the ROW for this alternative as it would under PacifiCorp Option 4. The difference is not likely to be substantial, however, so the area of disturbance for access roads summarized in Table 3-7 below is assumed to be the same as for PacifiCorp Option 4. Compared to the Proposed Project, disturbance for road areas for this alternative (including the Weed Segment) would increase by approximately 1.38 acres for Existing and 0.08 acres for New Permanent. Disturbance for Overland Access would decrease by approximately 1.55 acres.

**TABLE 3-7
SUMMARY OF ACCESS ROAD REQUIREMENTS
FOR THE PROJECT WITH MACKINTOSH/ALJ VARIATION A ALTERNATIVE**

Type of Road	Description	Area^a for Project with Mackintosh/ALJ Variation A	Area^a for Weed Segment
Existing	Typically double track. May have been graded previously. No other preparation required, although a few sections may need to be re-graded and crushed rock applied in very limited areas for traction.	5.13 acres	0.78 acres
New Permanent	Would be 12 feet wide, bladed. No other preparation required although crushed rock may need to be applied in very limited areas for traction.	0.09 acres	0.06 acres
Overland Access	No preparation required. Typically grassy areas that are relatively flat. No restoration would be necessary.	1.76 acres	0.13 acres

^a Based on typical road width of 12 feet.

Vegetation clearance may be greater for this alternative than for the Proposed Project. The existing ROW passes through mature stands of conifers and other types of vegetation for most of the approximately 1.4 miles from Pole 19/45 to Pole 14/48. Working within the ROW for pole installation and stringing conductor may require trimming of trees for line clearance requirements, and trimming or clearing of lower vegetation for access and fire safety requirements. In general, though, vegetation clearance for construction of this alternative would not be expected to be substantially different than would be required for routine maintenance of the ROW.

Construction workforce, equipment, and methods for this alternative would be essentially the same as described for the Proposed Project. The poles between 10/47 and 1/49 would be wood poles direct embedded to a depth of approximately 9 to 11 feet. Because this is a high wind area, storm guys (one guy wire anchored on each side of a pole perpendicular to the direction of the transmission line) would generally be required between Poles 13/47 to 12/48 (approximately 23 poles total). Span guys across Highway 97 to a stub pole would be required for Pole 5/48, as is the case for the existing pole at that location. However, because the new pole at 5/48 would be taller than the existing pole, the new pole would require 7 span guys rather than 4 for the existing pole. Also, the stub pole on the south side of Highway 97 would need to be approximately 20 feet taller than the existing stub pole.

PacifiCorp estimates that this alternative would take approximately 22 months to construct, as shown in Table 3-8 below.

Rationale for Full Analysis

Project Objectives

Based on PacifiCorp's projected construction schedule, completion of this alternative would not occur until spring of 2009. This would fail to meet PacifiCorp's objective of having the project complete prior to summer 2008 peak loads. However, PacifiCorp has projected that Line 14 would be at its thermal limit in summer 2008 and would exceed it in summer 2009. So this alternative would increase the risk of outages during summer 2008 only if the load is greater than currently projected. Also, the EIR team's independent review of PacifiCorp's construction schedule for this alternative suggests that the projected completion date may be overly pessimistic. The EIR team has identified commercial sources that could substantially shorten the lead time for a temporary 115/69 kV transformer, thereby accelerating the construction completion date for this alternative. Also, the proposed schedule shows "Right-of-way / property acquisition" would occur from November 2006 – April 2008, but there would be no permanent ROW easements required for this alternative. This alternative would therefore meet project objectives.

Feasibility

This alternative meets all legal, regulatory, and technical feasibility criteria. No additional ROW easements would be required.

**TABLE 3-8
PROPOSED CONSTRUCTION SCHEDULE
FOR THE PROJECT WITH MACKINTOSH/ALJ VARIATION A ALTERNATIVE**

Project Activity	Project with Mackintosh/ ALJ Variation A	Weed Segment
Permit To Construct decision adopted and effective	October 2007	October 2007
Acquisition of required permits	August 2006 – April 2007	February 2006 – October 2007
Right-of-way / property acquisition	November 2006 – April 2008	August 2007 – November 2007
Final engineering completed	January 2008	September 2007
Construction begins	January 2009	November 2007
Transmission line construction	January 2009 – March 2009	February 2007 – May 2008
Temporary Substation Construction	N/A	November 2007 – December 2007
Substation construction	N/A	November 2007 – May 2008
115/69kV transformer	October 2008	N/A
Construction temporary 115/69kV substation at Lucerne or Weed Substation	August 2008 – December 2008	N/A
Remove temporary 115/69kV substation	April 2009 – May 2009	N/A
Project operational	April 2009	June 2008
Clean up	May 2009 – July 2009	May 2008 – September 2008

Lessen Significant Environmental Impacts

This alternative would avoid any degradation of aesthetic resources or potential impacts to groundwater that may occur along the 1.4-mile segment of the Proposed Project between Poles 8/45 and new Pole 1.

Potential New Impacts Created

This alternative would result in construction along the centerline of the existing ROW for approximately 1.7 miles. The existing ROW passes through mature stands of conifers and other types of vegetation for most of the approximately 1.4 miles from Pole 19/45 to Pole 14/48. Working within the ROW for pole installation and stringing conductor may require trimming of trees for line clearance requirements, and trimming or clearing of lower vegetation for access and fire safety requirements. In general, though, vegetation clearance for construction of this alternative would not be expected to be substantially different than would be required for routine maintenance of the ROW. Even so, measured from existing conditions within the ROW, this may worsen potential impacts to biological resources compared to the Proposed Project. Also, the Highway 97 corridor along which portions of this alternative route would follow is part of the Volcanic Legacy Scenic Byway and a designated All American Road. The taller poles and

heavier conductor required for this alternative may result in degradation of scenic views to residents and visitors traveling Highway 97. And finally, a recorded cultural (historic and prehistoric) resource is known to occur in the vicinity of Pole 11/47 and may be impacted by construction activities for this alternative. However, at the screening stage these potential impacts are not defined sufficiently to eliminate this alternative from further consideration.

3.4.3 Mackintosh/ALJ Variation B

Description

This alternative was developed by the EIR team as a second variation to achieve construction of the transmission line upgrade entirely within PacifiCorp's existing ROW but without the technical and schedule constraints of the Option 4-ALJ3 and Mackintosh Option 5 alternatives. Similar to the PacifiCorp Option 4 alternative, this alternative would upgrade the existing 69 kV line from Pole 15/44 south to Pole 8/45 as described under the Proposed Project. At Pole 8/45 the 115 kV single circuit line would continue south with pole-for-pole replacement to Pole 19/45, where the alignment would veer east within an existing 69 kV line ROW following generally along Highway 97 until reaching the Weed Junction Substation (approximately 1.7 miles). The alignment of this alternative would be the same as for Mackintosh/ALJ Variation A and is shown in Figure 3-2.

Pole 19/45 for this alternative would be a custom steel structure similar to what Pole 8/45 would be under the Proposed Project. In the existing ROW between Poles 10/47 and 1/49 (approximately 33 poles total), a temporary pole line would be constructed approximately 15 feet south of the existing poles on a pole-for-pole basis. The existing 69 kV transmission line and distribution underbuild would then be moved over "hot" (energized) to the temporary poles. The existing poles in the centerline of the ROW would then be removed and new double circuit poles would be installed with new 115 kV conductor. When construction of the new poles with the new 115 kV conductor is complete, the 69 kV line and distribution underbuild would be moved over hot and the temporary poles removed.² The final result of this alternative would be a double circuit pole line in the center of the existing ROW with 115 kV, 69 kV, and distribution underbuild. The new double circuit poles would be approximately 10 to 30 feet taller than the existing poles, but in essentially the same location as the existing poles along that 1.7-mile segment. The pole types and heights for this alternative would be essentially the same as those listed in Appendix C for the PacifiCorp Option 4 alternative.

Under this alternative, the Weed Segment double circuit 115 kV line "loop" would begin at Pole 19/45 and proceed south to the Weed Substation rather than beginning at Pole 8/45 under the Proposed Project. The 11 poles from 8/45 to 18/45 (approximately 0.5 mile) would be single circuit 115 kV poles instead of double circuit, and so would be approximately 5 to 10 feet lower in height than they would under the Proposed Project. The double circuit line from 19/45 south

² A variation of this alternative would be to construct a new 69 kV transmission line on the temporary poles, then move that new line over to the new double circuit poles when construction is complete. Aside from how the new line would be terminated, this variation would not change the physical description of this alternative. Either variation may require an outage of from two to four hours when the conductor is transferred.

and the rebuild of the Weed Substation would be the same under this alternative as it would under the Proposed Project.

Temporary disturbance for structure work areas would be the same under this alternative as for the Proposed Project on per-pole basis. The total number of work areas for pole installation and removal would be higher under this alternative, as there would be approximately 12 more new poles (14 more wood poles and 2 fewer steel poles) and 33 temporary poles compared to the total under the Proposed Project and Weed Segment. Approximately 5 more tangent structure work areas (at Poles 1/48 to 3/48 and 11/48 to 12/48) would require site preparation and grading under this alternative compared to the Proposed Project. The average tangent structure work area is estimated to be approximately 5,000 square feet, so the 5 additional disturbed areas for this alternative would result in approximately 25,000 square feet (0.6 acres) greater disturbance. The total permanent footprint for poles under this alternative would be approximately 20 square feet greater than for the Proposed Project and Weed Segment. Table 3-9 summarizes the pole installation metrics for this alternative.

**TABLE 3-9
SUMMARY OF TYPICAL POLE INSTALLATION METRICS
FOR THE PROJECT WITH MACKINTOSH/ALJ VARIATION B ALTERNATIVE**

	Project with Mackintosh/ALJ Variation B 115 kV Single-circuit Transmission Line (approximate metrics)	Weed Segment 115 kV Double-circuit Transmission Line (approximate metrics)
Pole Diameter		
- Wood	24 inches	24 inches
- Self Supporting Steel	48 inches	48 inches
Auger Hole Depth		
- Wood	9 to 11 feet	9 to 12 feet
- Self Supporting Steel	20 to 25 feet	20 to 30 feet
Permanent Footprint per Pole		
- Wood	3.14 sq. feet	3.14 sq. feet
- Self Supporting Steel	12.56 sq. feet	12.56 sq. feet
Number of Poles		
- Wood	61	17
- Self Supporting Steel	2	3
Average Work Area around Pole (e.g., for old pole removal and new pole installation)		
- Tangent structure work areas	5,000 sq. feet	5,000 sq. feet
- Dead End/Angle structure work areas	5,400 sq. feet	5,400 sq. feet
Total Permanent Footprint for Poles	Approximately 0.005 acres	Approximately 0.001 acres

Pull/tension sites under this alternative would not be substantially different in total area of disturbance, but would occur in different locations than under the Proposed Project. Under this alternative, the pull/tension site at Pole 8/45 would be smaller than under the Proposed Project

because there would be no pull required toward the east. Pull/tension sites would be required at Poles 19/45 and 5/48 for this alternative, as shown on Figure 3-2.

Access road requirements for this alternative would be similar to those for the PacifiCorp Option 4 alternative. (While the location of overland access to the temporary poles for the Mackintosh/ALJ Variation B would be 15 feet south of the each existing pole, the total area of access roads would be essentially the same as for the PacifiCorp Option 4 alternative because that alternative would place new poles the same distance away but to the north of each existing pole). The area of disturbance for access roads is summarized in Table 3-10 below. Compared to the Proposed Project, disturbance for road areas for this alternative (including the Weed Segment) would increase by approximately 1.38 acres for Existing and 0.08 acres for New Permanent. Disturbance for Overland Access would decrease by approximately 1.55 acres.

**TABLE 3-10
SUMMARY OF ACCESS ROAD REQUIREMENTS
FOR THE PROJECT WITH MACKINTOSH/ALJ VARIATION B ALTERNATIVE**

Type of Road	Description	Area ^a Project with Mackintosh/ALJ Variation B	Area ^a Weed Segment
Existing	Typically double track. May have been graded previously. No other preparation required, although a few sections may need to be re-graded and crushed rock applied in very limited areas for traction.	5.13 acres	0.78 acres
New Permanent	Would be 12 feet wide, bladed. No other preparation required although crushed rock may need to be applied in very limited areas for traction.	0.09 acres	0.06 acres
Overland Access	No preparation required. Typically grassy areas that are relatively flat. No restoration would be necessary.	1.76 acres	0.13 acres

^a Based on typical road width of 12 feet.

Vegetation clearance would be greater for this alternative than for the Proposed Project. The existing ROW passes through mature stands of conifers and other types of vegetation for most of the approximately 1.4 miles from Pole 19/45 to Pole 14/48. Installation of the temporary pole line 15 feet to the south would require trimming and removal of trees for line clearance requirements, and trimming or clearing of lower vegetation for fire safety requirements. Some of this tree trimming/removal and vegetation clearance may need to occur just outside the south edge of the ROW to ensure that windy conditions would not compromise system reliability while the temporary line is in place. The exact number and location of trees that would have to be substantially trimmed or removed outside the ROW would be determined during final surveying and engineering design, but may include some trees larger than 10 inches diameter at breast height (dbh).

Construction workforce, equipment, and methods for this alternative would be essentially the same as described for the Proposed Project. The temporary structures between 10/47 and 1/49 would be wood poles direct embedded to a depth of 8 to 10 feet, and would require down-guys similar to the existing poles. The down-guys for the temporary poles at 16/47 through 4/48 may encroach into the Highway 97 ROW, and the temporary pole at 5/48 may require a span guy across Highway 97, thus requiring a temporary construction easement from Caltrans. The new double circuit poles between 10/47 and 1/49 would be wood poles direct embedded to a depth of approximately 9 to 11 feet. Because this is a high wind area, storm guys (one guy wire anchored on each side of a pole perpendicular to the direction of the transmission line) would generally be required between Poles 13/47 to 12/48 (approximately 23 poles total). Span guys across Highway 97 to a stub pole would be required for Pole 5/48, as is the case for the existing pole at that location. However, because the new pole at 5/48 would be taller than the existing pole, the new pole would require 7 span guys rather than 4 for the existing pole. Also, the stub pole on the south side of Highway 97 would need to be approximately 20 feet taller than the existing stub pole.

PacifiCorp estimates that this alternative would take approximately 11 months to construct, as shown in Table 3-11 below.

**TABLE 3-11
PROPOSED CONSTRUCTION SCHEDULE
FOR THE PROJECT WITH MACKINTOSH/ALJ VARIATION B ALTERNATIVE**

Project Activity	Project with Mackintosh/ALJ Variation B	Weed Segment
Permit To Construct decision adopted and effective	October 2007	October 2007
Acquisition of required permits	August 2006 – April 2007	February 2006 – October 2007
Right-of-way / property acquisition	November 2006 – April 2008	August 2007 – November 2007
Final engineering completed	January 2008	September 2007
Construction begins	May 2008	November 2007
Construct temporary 69 kV line	May 2008 – June 2008	N/A
Transmission line construction	July 2008 – August 2008	February 2007 – May 2008
Temporary Substation Construction	N/A	November 2007 – December 2007
Substation construction	N/A	November 2007 – May 2008
Project operational	September 2008	June 2008
Clean up	August 2008 – October 2008	May 2008 – September 2008

Rationale for Full Analysis

Project Objectives

Based on PacifiCorp's projected construction schedule, completion of this alternative would not occur until late summer of 2008. This would fail to meet the objective of having the project complete prior to summer 2008 peak loads. However, PacifiCorp has projected that Line 14 would be at its thermal limit in summer 2008 and would exceed it in summer 2009. So this alternative would increase the risk of outages during summer 2008 only if the load is greater than currently projected. Also, the EIR team's independent review of PacifiCorp's construction schedule for this alternative suggests that the projected completion date may be overly pessimistic. For example, the proposed schedule shows "Right-of-way / property acquisition" would occur from November 2006 – April 2008, with construction starting in May 2008. As there would be no permanent ROW easements required for this alternative, it is not likely that construction would have to wait until May 2008. This alternative would therefore meet project objectives.

Feasibility

This alternative meets all legal, regulatory, and technical feasibility criteria. No additional permanent ROW easements would be required. Construction easements may be required from Caltrans or other property owners to facilitate construction activities for the temporary pole line.

Lessen Significant Environmental Impacts

This alternative would avoid any degradation of aesthetic resources or potential impacts to groundwater that may occur along the 1.4-mile segment of the Proposed Project between Poles 8/45 and new Pole 1.

Potential New Impacts Created

This alternative would result in construction within the existing ROW for approximately 1.7 miles. The existing ROW passes through mature stands of conifers and other types of vegetation for most of the approximately 1.4 miles from Pole 19/45 to Pole 14/48. Installation of the temporary pole line 15 feet to the south would require trimming and removal of trees for line clearance requirements, and trimming or clearing of lower vegetation for fire safety requirements. Some of this tree trimming/removal and vegetation clearance may need to occur just outside the south edge of the ROW to ensure that windy conditions would not compromise system reliability while the temporary line is in place. Because some of the trees requiring trimming or removal may be larger than 10 inches dbh, this alternative may worsen potential impacts to biological resources compared to the Proposed Project. Also, the Highway 97 corridor along which portions of this alternative route would follow is part of the Volcanic Legacy Scenic Byway and a designated All American Road. The taller poles and heavier conductor required for this alternative may result in degradation of scenic views to residents and visitors traveling Highway 97. And finally, a recorded cultural (historic and prehistoric) resource is known to occur in the vicinity of Pole 11/47 and may be impacted by construction activities for this alternative.

However, at the screening stage these potential impacts are not defined sufficiently to eliminate this alternative from further consideration.

3.4.4 No Project Alternative

CEQA requires an evaluation of the No Project Alternative in order that decision makers can compare the impacts of approving the project with the impacts of not approving the project. According to CEQA Guidelines (Section 15126.6[e]), the No Project Alternative must include:

- (a) the assumption that conditions at the time of the Notice of Preparation (i.e., baseline environmental conditions) would not be changed since the Proposed Project would not be installed, and
- (b) the events or actions that would be reasonably expected to occur in the foreseeable future if the project were not approved. The first condition is described in the EIR for each environmental discipline as the “environmental baseline,” since no impacts of the Proposed Project would be created. This section defines the second condition of reasonably foreseeable actions or events. The impacts of these actions are evaluated in each issue area’s analysis in Section 4.

Under the No Project alternative, the Proposed Project would not be implemented. Upgrade of the existing 69 kV transmission line from Pole 15/44 to Pole 8/45 and installation of a new 115 kV line eastward from Pole 8/45 for approximately 1.6 miles to the Weed Junction Substation would not occur. Under the No Project alternative, Line 1 would not be operational because there would be no 115 kV transmission line connection between the Yreka and Weed Junction Substations. None of the Project Objectives would be met, and the Weed area would potentially experience a shortage of electricity during both the summer and winter peaks until a new project could be designed, permitted, and constructed to provide additional transmission capacity or local power generation to the area.

It would be speculative to predict the type and location or schedule of development for new power plants and transmission needed to overcome the transmission system constraints remaining under the No Project Alternative. However, for purposes of this analysis, the No Project Alternative could include either of the following components or combination of components:

- Construction of new transmission facilities at 115 kV or higher voltage, requiring the development of a new transmission corridor from either the east or north into the Weed area. Figure 2-2a in Section 2, *Project Description*, shows that such a new corridor would be substantially longer than the Proposed Project and Weed Segment.
- Construction of additional regional generation.

3.5 Alternatives Eliminated from Full EIR Evaluation

As discussed in Section 3.1, alternatives were assessed for their ability to reasonably achieve the project objectives and reduce the significant environmental impacts of the Proposed Project. Also, their technical, legal, and regulatory feasibility was evaluated. Based on these screening criteria, the alternatives eliminated from EIR consideration are listed above in Section 3.3.2. The rationale for elimination of each alternative is presented below.

3.5.1 PacifiCorp Option 1

Description

This Alternative (called Option 1 in the PacifiCorp Application and PEA) would include upgrading the existing 69 kV line from Pole 15/44 to Pole 8/45 as described under the Proposed Project. At Pole 8/45 the line would continue south with pole-for-pole replacement to Pole 19/45, where the alignment would veer east to parallel an existing 69 kV line generally along Hwy 97 until reaching the Weed Junction Substation. New poles would be installed approximately 50 feet directly north of those in the existing 69 kV ROW, thus requiring an additional 50-foot ROW easement for approximately 1.7 miles. For this alignment, the spans between the new poles may be longer than those in the existing 69 kV ROW, as distribution underbuild would not be required on the new poles. When completed, this Alternative would have two sets of poles – the existing 69 kV line with distribution underbuild, plus the new 115 kV line on new poles approximately 50 feet north of the existing 69 kV poles, resulting in a 100-foot total easement.

Vegetation clearance would be substantially greater for this alternative than for the Proposed Project. The existing ROW passes through mature stands of conifers and other types of vegetation for most of the approximately 1.4 miles from Pole 19/45 to Pole 14/48. Expanding the ROW 50 feet to the north in this area would require trimming and removal of trees for line clearance requirements, and trimming or clearing of lower vegetation for fire safety requirements. The exact number and location of trees that would have to be removed by expanding the ROW 50 feet to the north would be determined during final surveying and engineering design, but would likely include at least 75 trees larger than 10 inches diameter at breast height (dbh) with some in excess of 30 inches dbh (based on field observations noted by ESA biologists for the Constraints Analysis conducted for the Mitigated Negative Declaration (Appendix A in CPUC, 2006)).

Rationale for Elimination

This alternative meets project objectives and is technically feasible, but would have substantially greater impacts to biological resources compared to the Proposed Project because of the substantial and permanent tree removal that would be required to expand the ROW by 50 feet. Because there are other feasible alternatives which follow generally the same route but which avoid the substantial impacts to biological resources associated with doubling the width of the ROW, this alternative is eliminated from further consideration.

3.5.2 Mackintosh Option 5

Description

This alternative, suggested by property owners Don and Judy Mackintosh, would upgrade the existing 69 kV Line 1 to 115 kV starting from Pole 15/44 and proceeding southerly to the Weed Substation, then looping back to the north with a double circuit on the same poles to Pole 19/45. From Pole 19/45 the line would turn to the east and replace the 69 kV Line 1 using the existing poles to Weed Junction Substation.

For the easterly segment, the existing Line 1 between Weed and Weed Junction would be shut down and removed from Pole 19/45 to Weed Junction to clear the existing pole line for new 115 kV conductors to be installed on the existing poles. All work would be within the existing ROW. The end result would be a single pole line in the existing 50-foot wide easement carrying 115 kV and distribution circuits.

With removal of the 69 kV line from Weed to Weed Junction, the Weed Substation (and International Paper) would be cut-off from its sole 69 kV power source and would be served only by the upgraded 115 kV Line 75 from Yreka. This alternative proposes that the Weed Substation upgrade plan be modified to include a separate 115/69 kV transformer or a single three-winding 115/69/12.5 kV transformer to serve power at 69 kV to International Paper and at 12 kV for the local distribution. This new equipment would require an expansion of the Weed Substation footprint by up to 20,000 square feet.

Rationale for Elimination

This alternative would avoid establishing a new ROW or either expanding or shifting the existing ROW for the proposed transmission line, and so would avoid any degradation of aesthetic resources or impacts to groundwater that may occur along the 1.4-mile segment of the Proposed Project between Poles 8/45 and new Pole 1. This alternative would not be likely to result in any substantial new environmental impacts along its proposed alignment. At the Weed Substation, however, the substantial increase in footprint required to accommodate the additional permanent transformer and related equipment would result greater aesthetic impacts than under the Proposed Project. While this alternative would shift potential impacts from one location to another, it does not cause this alternative to fail the environmental screening criteria.

However, this alternative does not meet the criteria for technical feasibility. It proposes eliminating the existing 69 kV line and replacing it with a 115 kV line using the existing poles for the approximately 1.7-mile route between Pole 19/45 and the Weed Junction Substation. This is not technically feasible for the following reasons:

- the existing poles are too short to provide the required minimum ground clearance because the heavier conductor required for the 115 kV line would have greater sag at mid-span than the existing 69 kV line; this would be in violation of CPUC General Order (GO) 95

- minimum clearance requirements between the transmission and distribution circuits would increase from 44 inches for the 69 kV line to 69 inches for the 115 kV line (per National Electric Safety Code Rules 235E1 and 235E3B); this increased clearance could not be achieved on the existing poles without dropping the distribution circuit below the minimum ground clearance required in GO95
- the existing poles would not meet GO95 criteria for wind and ice loading with the larger (and heavier) insulators and heavier conductor required for the 115 kV line.

Also, the substantial additional footprint (20,000 square feet) required at the Weed Substation to accommodate the additional permanent transformer and hardware would require property to be purchased from adjacent landowners. Given the physical constraints of the site, this may not be feasible. And finally, removal of the 69 kV line between the Weed Junction and Weed Substations would eliminate PacifiCorp's ability to provide support at 69 kV to Line 2 at Weed Junction resulting in reduced system reliability and failure to meet project objectives. This alternative is therefore eliminated from further consideration.

It is important to note that eliminating this alternative does not remove from consideration the route which this alternative would follow. The Mackintosh/ALJ Variation A and Variation B alternatives which are carried forward for analysis in this EIR follow this same route, meet project objectives, and are technically feasible.

3.5.3 Option 4-ALJ3

Description

This alternative consists of upgrading existing 69 kV Line 1 to 115 kV starting from Pole 15/44 and proceeding southerly to the Weed Substation and then looping back to the north with a double circuit on the same poles to Pole 19/45. From Pole 19/45 the line would turn to the east following the same alignment as the 69 kV Line 1 running from Weed Substation to Weed Junction Substation.

For construction of the easterly segment, the existing 69 kV Line 1 would be de-energized and the line demolished. In its place, within the existing ROW, a new double circuit 115/69 kV line would be built. The end result would be one double-circuit pole line in the existing 50-foot wide easement carrying 115 and 69 kV circuits and distribution underbuild.

Prior to de-energizing the existing 69 kV line, additional modifications to the Weed Substation would need to be completed to provide continuous 69 kV service to the International Paper substation. This alternative would require either adding a permanent 115/69 kV transformer in addition to the planned 115/12 kV transformer, or adding a single "three-wire" 115/69/12.5 kV transformer. Adding this equipment to the Weed Substation would require a permanent expansion of the footprint by approximately 5,000 square feet. Power for the Weed Substation load would then be provided entirely through the upgraded Line 75 at 115 kV from Yreka until the easterly segment and Weed Junction tie-in was completed.

Rationale for Elimination

This alternative would avoid establishing a new ROW or either expanding or shifting the existing ROW for the proposed transmission line, and so would avoid any degradation of aesthetic resources or impacts to groundwater that may occur along the 1.4-mile segment of the Proposed Project between Poles 8/45 and new Pole 1. This alternative would not be likely to result in any substantial new environmental impacts along its proposed alignment. At the Weed Substation, however, the 5,000 square foot increase in footprint required to accommodate the additional permanent transformer and related equipment would result greater aesthetic impacts than under the Proposed Project. While this alternative would shift potential impacts from one location to another, it does not cause this alternative to fail the environmental screening criteria.

Using a single “three-wire” 115/69/12.5 kV transformer for this alternative is not technically feasible because of reliability issues. Failure of the three-wire transformer would put both secondary voltages out of service, thereby causing prolonged outages to industrial as well as residential customers. As three-wire transformers are rarely used, there would be no backups available and standard two-wire transformers could not be used as backup. So this alternative would require use of separate 115/69 kV and 115/12 kV transformers at the Weed Substation to avoid the risk of prolonged outages.

PacifiCorp states that it has no spare 115/69 kV transformers in its inventory that could be dedicated as a permanent transformer for the Weed Substation, and the lead time for procurement of a new transformer for permanent installation is approximately 15 months; this estimate was independently verified by the EIR team. This long lead time would extend the construction schedule into the summer of 2009, past the estimated time when Line 14 is projected to exceed its thermal limit resulting in PacifiCorp’s failure to meet Western Electricity Coordinating Council (WECC) N-1 Criteria (see Appendix B), thus creating a risk of prolonged outage to the area. Therefore, this alternative fails to substantially meet all three objectives of the Proposed Project and is eliminated from further consideration.

It is important to note that eliminating this alternative does not remove from consideration the route which this alternative would follow. The Mackintosh/ALJ Variation A and Variation B alternatives which are carried forward for analysis in this EIR follow this same route, meet project objectives, and are technically feasible.

3.5.4 Undergrounding

Description

This alternative would consist of installing the new 115 kV transmission line underground for the approximately 1.7-mile easterly segment to the Weed Junction substation. The potential routes for this underground installation would include (a) the same route as the Proposed Project east from Pole 8/45, (b) the same route as the existing ROW east from Pole 19/45, or (c) through the Caltrans ROW for Highway 97. The terminal point for each of these routes would be the Weed Junction Substation.

Open trenching would be the most common construction method, and would involve a wheel- or track-mounted excavator advancing across the proposed route. Typical trench dimensions would be approximately 5 to 8 feet wide and 5 to 10 feet deep, depending upon soil conditions and other factors. The ground disturbance for open trenching would be up to 40-feet wide, resulting in a total disturbed area of approximately 8 acres for the 1.7-mile route. Each of the 3 conductors for the 115 kV transmission line would be installed in an individual pipe. Often a fourth (spare) pipe is installed to facilitate subsequent replacement of a damaged pipe or conductor without reopening the entire trench. The pipes would be encased in thermal concrete and surrounded by thermal backfill materials. A 10-foot wide by 24-foot long splice vault would be required approximately every 1,800 feet.

Wetland areas or other sensitive surface features would likely be avoided by either horizontal directional drilling (HDD) or direct boring methods. The HDD construction technique uses a hydraulically-powered horizontal drilling rig to tunnel under vertically and/or horizontally large sensitive surface features. Direct boring is a non-steerable construction technique that advances a drill stem for short distances under surface features such as roads. For the HDD or direct boring construction method, excavation of pits for cable pulling and conduit installation would be required on either side of the surface feature to be avoided. These pits would be approximately 40 to 50 feet wide by 10 to 20 feet deep and up to 100 feet long depending upon the length of the boring.

Subsurface volcanic debris and rock outcroppings in the project area would likely require extensive overexcavation and backfilling of the trench with suitable backfill material. Depending upon the route, such subsurface conditions may also require rock drilling and/or blasting. Encountering these conditions along the Highway 97 route would require lane closures and other prolonged traffic controls.

Rationale for Elimination

This alternative is technically feasible, as all of the construction techniques are widely used. However, the difficult soil conditions and the sensitive environmental resources that would have to be avoided would substantially delay completion of the project and would likely result in PacifiCorp's failure to meet its objective of meeting electric system demand and improving system reliability prior to Line 14 exceeding its thermal limit.

While this alternative would avoid the potential aesthetic impacts of the Proposed Project, it fails to meet the environmental criteria overall. Temporary construction impacts to air quality, traffic, and noise would be much greater than the Proposed Project. Substantial and permanent impacts could occur to biological resources (e.g., wetland features and special status species) and surface and groundwater resources from the construction activities, especially where drilling and blasting would be required. The potential to impact significant cultural resources would also be very high, as there is a known resource in the existing ROW and there is a high likelihood of encountering previously unknown resources in the other potential alignments.

3.5.5 Non-Wires – Energy Conservation and Demand Side Management

Description

Non-Wires – Energy Conservation and Demand Side Management programs are designed to reduce customer energy consumptions. CPUC regulatory requirements dictate that supply-side and demand-side resource options should be considered on an equal basis in a utility's plan to acquire lowest cost resources. These programs are designed to either reduce the overall use of energy or to shift the consumption of energy to off-peak times.

PacifiCorp offers a number of energy efficiency programs in California. PacifiCorp currently offers programs such as the irrigation initiative to help irrigators in California make their operations more efficient, on-site energy audits/analysis services for business customers, and home energy analysis to help residential customers become more aware of their energy usage and provide them with personalized recommendations to make their home more energy-efficient. In addition, PacifiCorp provides customers free brochures on improving energy efficiency.

Rationale for Elimination

Reductions in demand through energy conservation programs are part of PacifiCorp's future operations and are incorporated into its long-term peak load forecasts. As separate and stand alone programs, however, these programs do not provide either the capacity or reliability needs of PacifiCorp, as stated in their objectives for the Proposed Project. Furthermore, without completing the Line 1 upgrade to 115 kV, the Weed Segment could not be built, thereby failing to meet the objectives of that project. For these reasons, this alternative has been eliminated from further consideration.

3.5.6 Non-Wires – Renewable Energy Resources

Description

California's Renewable Portfolio Standard (RPS) requires retail sellers of electricity to increase their procurement of eligible renewable resources by at least 1 percent per year so that 20 percent of their retail sales are procured from eligible renewable energy resources by 2017. The RPS Program was mandated by Senate Bill 1078 (SB 1078, Sher, Chapter 516, Statutes of 2002) under Public Utilities Code sections 381, 383.5, 399.11 through 399.15, and 445. The CPUC in collaboration with the California Energy Commission (CEC), is addressing its responsibilities in implementing the RPS through its own proceedings. On April 22, 2004 the CPUC issued an Order Instituting Rulemaking (OIR) to specifically address the RPS (R.04-04-026). On March 8, 2003, the CEC and the CPUC approved an Energy Action Plan in addition to the Renewable Portfolio Standard. On September 21, 2005, the Energy Action Plan II was finalized. The shared goal of the Energy Action Plan is to:

“Ensure that adequate, reliable, and reasonably-priced electrical power and natural gas supplies, including prudent reserves, are achieved and provided through policies, strategies, and actions that are cost-effective and environmentally sound for California’s consumers and taxpayers.”

In January 2006, the CPUC created the California Solar Initiative (CPUC ruling R.04-03-017) which moves the consumer renewable energy rebate program for existing homes from the CEC to the utility companies under the direction of the CPUC. This new incentive program, for renewable systems of less than one megawatt, begins in January 2007 and provides a total of \$2.9 billion over ten years.

Beginning in 2007, the CEC will manage \$350 million targeted for new residential building construction. It will use funds already allocated to the CEC to foster renewable projects between 2007 and 2011. Called the New Solar Homes Partnership, it will focus on new residential construction.

The Renewable Resources Development Report (CEC, 2003) prepared by the California Energy Commission, identifies renewable resources that are available to the PacifiCorp territory. These resources include geothermal and solar as the principal resources. Wind resources are more prevalent far to the south, in the Altamont Pass, Tehachapi, and San Geronio areas of the State. Solar energy facilities are also located principally outside the PacifiCorp service territory, however, the southern portion of Siskiyou County has some solar resource potential.

Most of California’s developed geothermal resources are located in Sonoma, Lake, Imperial, and Inyo Counties. Other geothermal resource areas in the state are found in Lassen, Mono, Siskiyou, and Modoc Counties. Some of the sites for new geothermal development are located in areas characterized by sensitive cultural and environmental concerns. Other issues that could delay development include permitting and access to transmission. The technologies most often used to produce electricity from geothermal resources in California are flash steam power and binary cycle power plants. The flash steam power technology is typically used at sites that have high temperature fluids (usually above 400 degrees Fahrenheit). Fluids at these sites boil into steam as they rise to the surface. The steam is used to power a turbine, which turns a generator to produce electricity. Binary cycle power plants can be used with lower temperature geothermal resources where the water does not become steam before rising to the surface.

At present, there are over 16,000 wind turbines in the U.S., with most of them located in California. In total, approximately 1,800 megawatts (MW) of electricity is generated from 105 separate wind farms. According to the Renewable Resources Development Report (CEC, 2003), Siskiyou County has a low potential for wind generation capacity. Even in high capacity areas, wind energy technology requires approximately 5 to 6 acres per megawatt of wind power. In addition, the main obstacle to utilizing wind generation is the lack of existing transmission infrastructure to transport the wind-generated power to the grid.

Currently there are two types of solar generation available: solar thermal power (also known as concentrating solar power) and photovoltaic (PV) power generation. At present, California

generates approximately 345MW of power with solar thermal power plants, with the majority of these facilities being parabolic-trough electric plants installed in the Mojave Desert, due to the large tracks of land required for this technology. Photovoltaic (PV) power systems are available on a significantly smaller scale, and have received increased support from private and public sections since the 1970s. PV systems typically convert about 10 percent of the available solar energy to alternating current electricity, and require approximately one square kilometer (247 acres) for a 100MW rated power system.

Rationale for Elimination

Renewable resources for renewable energy programs are part of PacifiCorp's future operations and are incorporated into its long-term peak load forecasts. As separate and stand-alone programs, however, the renewable resource alternative would not replace the need for upgrading the existing transmission infrastructure in the Proposed Project area. Indeed, transmission system constraints are noted by the CEC as a substantial impediment to effective integration of renewable resources state wide. Because renewable resources would not provide either the capacity or reliability needs of PacifiCorp, as stated in the objectives for the Proposed Project, and transmission infrastructure upgrades would still be required to integrate any renewable resources, this alternative has been eliminated from further consideration.

3.6 Cumulative Projects

As required by CEQA (Section 15130 et seq. of the CEQA Guidelines), this EIR includes an analysis of "cumulative impacts." CEQA defines cumulative impacts as two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts. The cumulative analysis is intended to describe the "incremental impact of the project when added to other, closely related past, present, or reasonably foreseeable probable future projects" and can result from "individually minor but collectively significant projects taking place over a period of time" (CEQA Guidelines, Section 15355).

A cumulative scenario has been developed to identify projects that are reasonably foreseeable and that would be constructed or operated during the life of the Proposed Project. The projects that comprise the cumulative impact scenario do not include existing projects that are under construction now, completed, or in operation. Existing projects are included as part of the environmental setting for individual issue areas and are analyzed with respect to each resource issue area in Chapter 4.

The projects considered to be part of the cumulative scenario are presented in Table 3-12, which also describes the approximate geographic location of each project. The projects in the cumulative scenario include a range of project types from small single-family housing developments and road improvements to one industrial project. Proposed and pending projects are presented that are in the vicinity of the Proposed Project, Weed Segment and alternatives.

**TABLE 3-12
CUMULATIVE SCENARIO – APPROVED AND PENDING PROJECTS**

APN or Project Name	Description	Address / Location	Agency / Organization	Details	Status / Timeline	Distance from Proposed Project/Weed Segment
Weed NB & SB Safety Roadside Rest Area Rehab (Project No. 36200)	Rehabilitate facilities	Interstate 5, Postmile R25.6 (Approximately six miles north of the City of Weed).	Caltrans	Unavailable	In design phase. Estimated construction period from November 2007 to September 2009.	Approximately four miles northwest of the Proposed Project.
North Edgewood Overhead Bridge Deck Rehab (Project No. 2C260)	Bridge deck rehabilitation	Interstate 5, Postmile 25.22	Caltrans	Unavailable	In construction phase. Unavailable information on estimated completion date.	Approximately 3.5 miles northwest of the Proposed Project.
Shasta River Bridges (Project No. 2C710)	Replace deck and strengthen	Interstate 5, Postmile R22.3/R22.9	Caltrans	Unavailable	In design phase. Estimated construction period of February 2009 to July 2010.	Approximately two miles west of the Weed Substation.
Downtown Weed Rehab (Project No. 35990)	Roadway rehabilitation in downtown Weed	Highway 97, Postmile L0.0/0.2 (In the City of Weed at Route 5 and Route 265).	Caltrans	Unavailable	In design phase. Estimated construction period from June 2007 to December 2009.	Approximately one-half mile south of the Weed Substation.
UP-07-05	Use permit	Located at Roseburg Forest Products near the intersection of Alamo Avenue and Highway 97.	Siskiyou County	A use permit for Roseburg Forest Products to install a steam driven 15 mW cogeneration system to be operated with a previously permitted boiler.	In environmental review process. Estimated construction period unavailable.	Immediately east of the Weed Substation, across Highway 97.
APN 020-410-170 and APN 020-400-130	Zone changes.	19030 Rainbow Way, approximately 800 feet northeast of the Weed City Limits on State Route 97.	Siskiyou County	Rezone a 33.3-acre parcel from Non-Prime Agricultural (AG-2-B-40) to Non-Prime Agricultural (AG-2) and a 1.4 acre parcel from Neighborhood Commercial to Rural Residential Agricultural. A church (Weed Berean Church) is proposed for construction on the parcels.	Rezone is in the final stages of approval. Rezone has been approved by the Planning Commission and is waiting for mapping details to be finalized. Construction period for the church is unknown.	Immediately adjacent to the southeastern end of the Proposed Project route, near Weed Junction Substation.

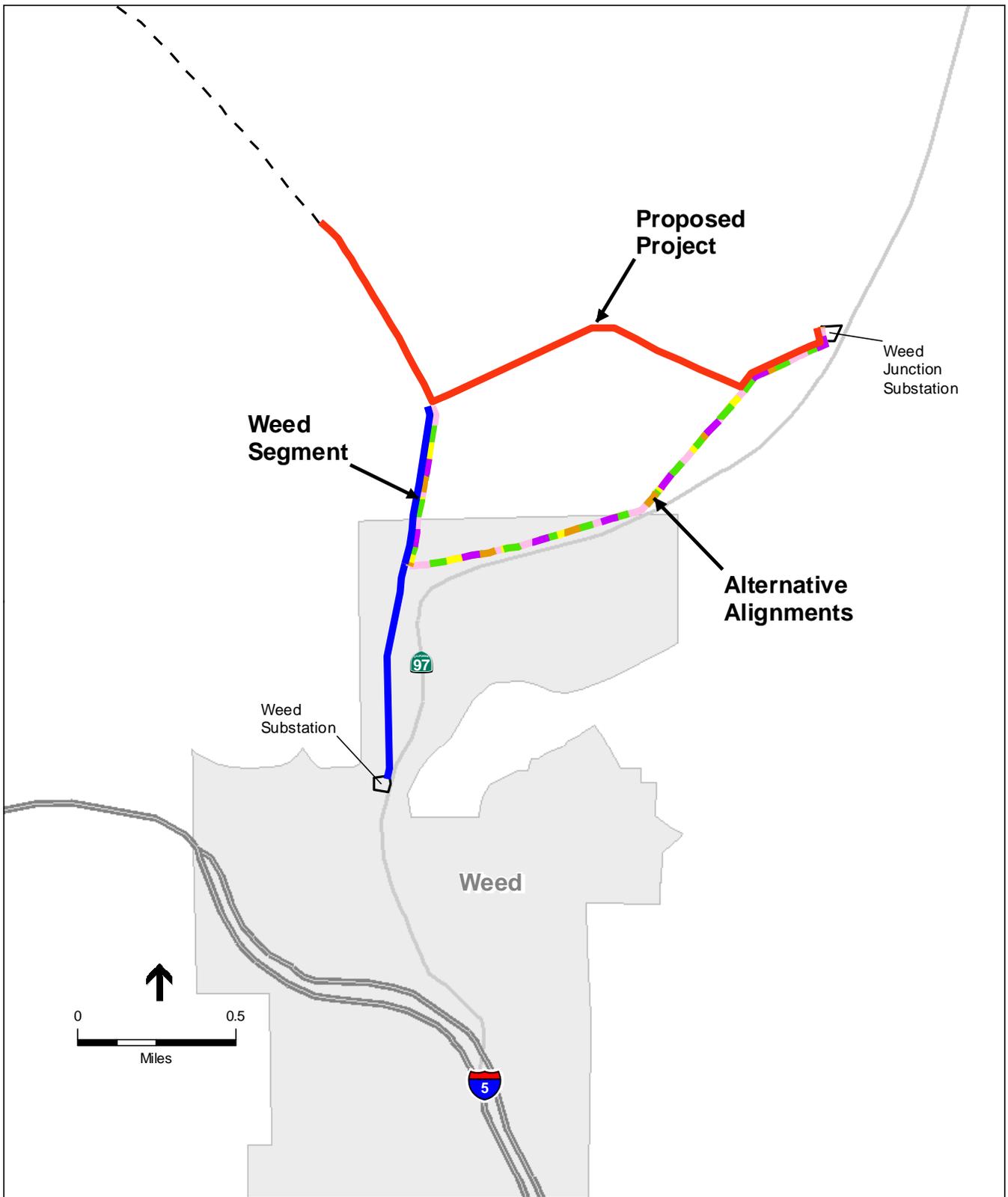
TABLE 3-12 (Continued)
CUMULATIVE SCENARIO – APPROVED AND PENDING PROJECTS

APN or Project Name	Description	Address / Location	Agency / Organization	Details	Status / Timeline	Distance from Proposed Project/Weed Segment
Alamo Avenue Rehabilitation	Road rehabilitation.	City of Weed, Siskiyou Way and Alamo Avenue Rehabilitation	City of Weed	Rehabilitate curb, gutter, sidewalks, resurface, and improve drainage.	Will go to bid sometime later this summer with anticipated award of contract late fall. Construction is expected in the late Spring/Summer of 2008.	Approximately 2,000 feet southeast of the Weed Segment (Weed Substation).
APN 020-130-090	Annex 120.5 acres.	Just north of City limits, along both sides of Hoy Road	City of Weed	Re-zone for single family residential, and subdivide four parcels.	Little activity since permit submission.	Approximately 200 feet east of the Weed Segment.
APN 060-241-010 and APN 060-241-120	Annex 24.4 acres.	East of Highway 97, across from Alamo Avenue.	City of Weed	Will combine with 15.2 acres in City limits for residential development.	Little activity since permit submission.	Approximately 500 feet east of the Weed Segment.
Michelon Subdivision (APN 060-221-010, APN 060-241-110, and APN 060-231-090)	Parcel subdivision.	Off the west end of W. Lincoln Avenue, west of Kennedy Avenue.	City of Weed	Subdivide into four parcels for residential use; one parcel will be an equipment yard and shop.	The final map is in the plan checking stage.	Approximately 300 feet west of the Weed Segment.
Yreka-Weed 115kV Transmission Line Project, Northern portion, multiple APN's	Permit to Construct	Project joins with Proposed Project at Pole 15/44 just west of Hoy Road. Weed Junction Substation located along HWY 97 near Carrick.	CPUC	17 mile transmission line upgrade, modifications to Yreka and Weed Junction substations and a rebuild of the Lucerne Substation	Approved construction to Pole 14/44 and substation work. Construction complete to Pole 19/43. All substation work complete. Completion of the approximately 0.5 miles section from Pole 19/43 to Pole 14/44 is planned to occur with construction of the Southern Portion.	Immediately adjacent to the Proposed Project at Pole 15/44 just west of Hoy Road.

SOURCES: Salvestrin, 2007a and 2007b; Shaw-Ritter, 2007a, 2007b, and 2007c; Anderson, 2007; and PacifiCorp, 2007.

References – Alternatives and Cumulative Projects

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- Shaw-Ritter, Beverly, 2007c. Planning Technician, Siskiyou County Planning Department, phone communication, June 7, 2007.



PacifiCorp's Weed-Yreka Transmission Line Upgrade - Southern Portion. 205439
 SOURCES: ESA (2007), PacifiCorp (2007), ESRI Streetmap USA (2006)

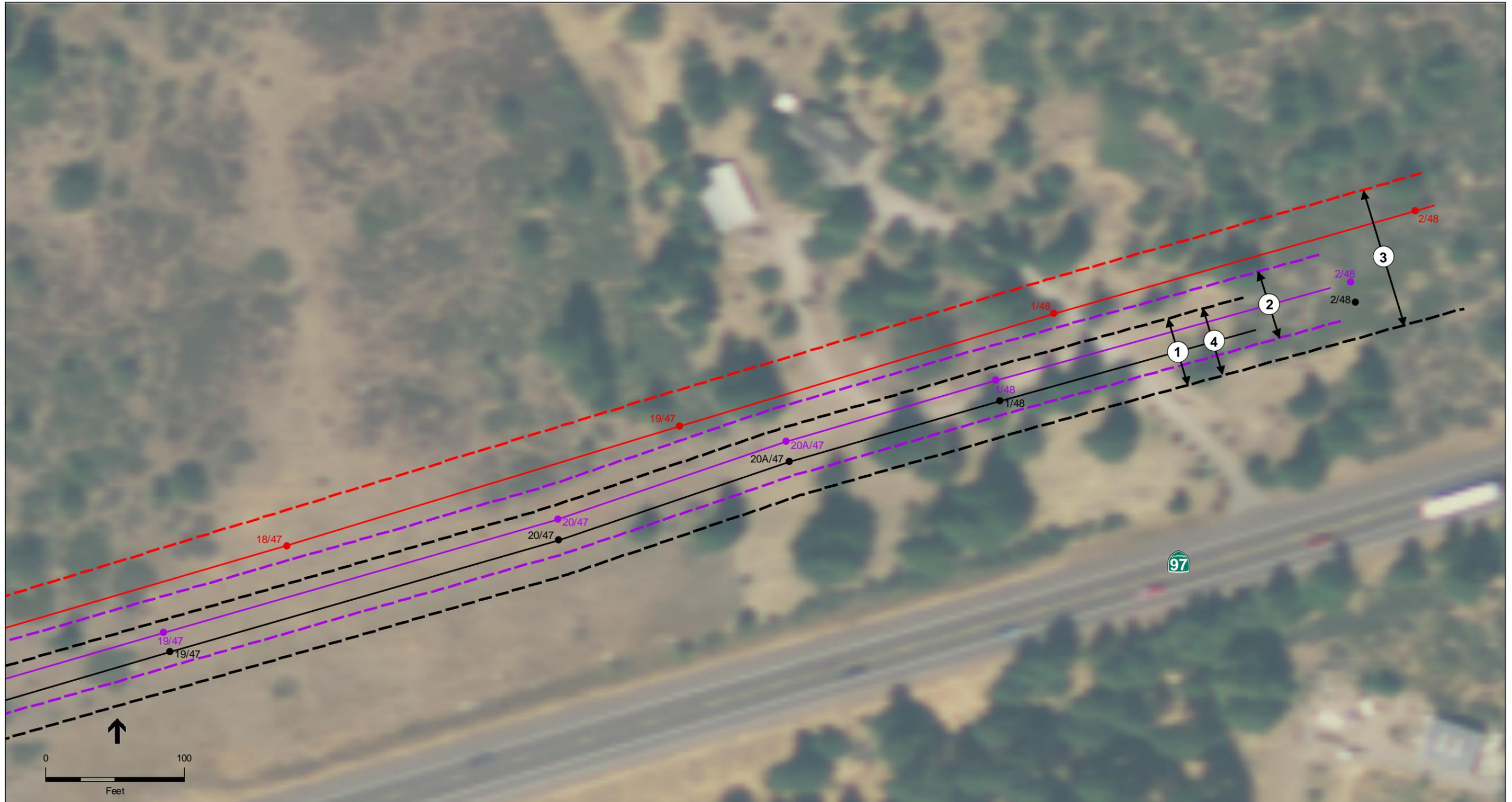
Figure 3-1

Overview of Alternative Alignments

Alternatives

- PacifiCorp Option 1
- PacifiCorp Option 4
- Mackintosh/ALJ Variations A and B
- Mackintosh Option 5
- Option 4 - ALJ3

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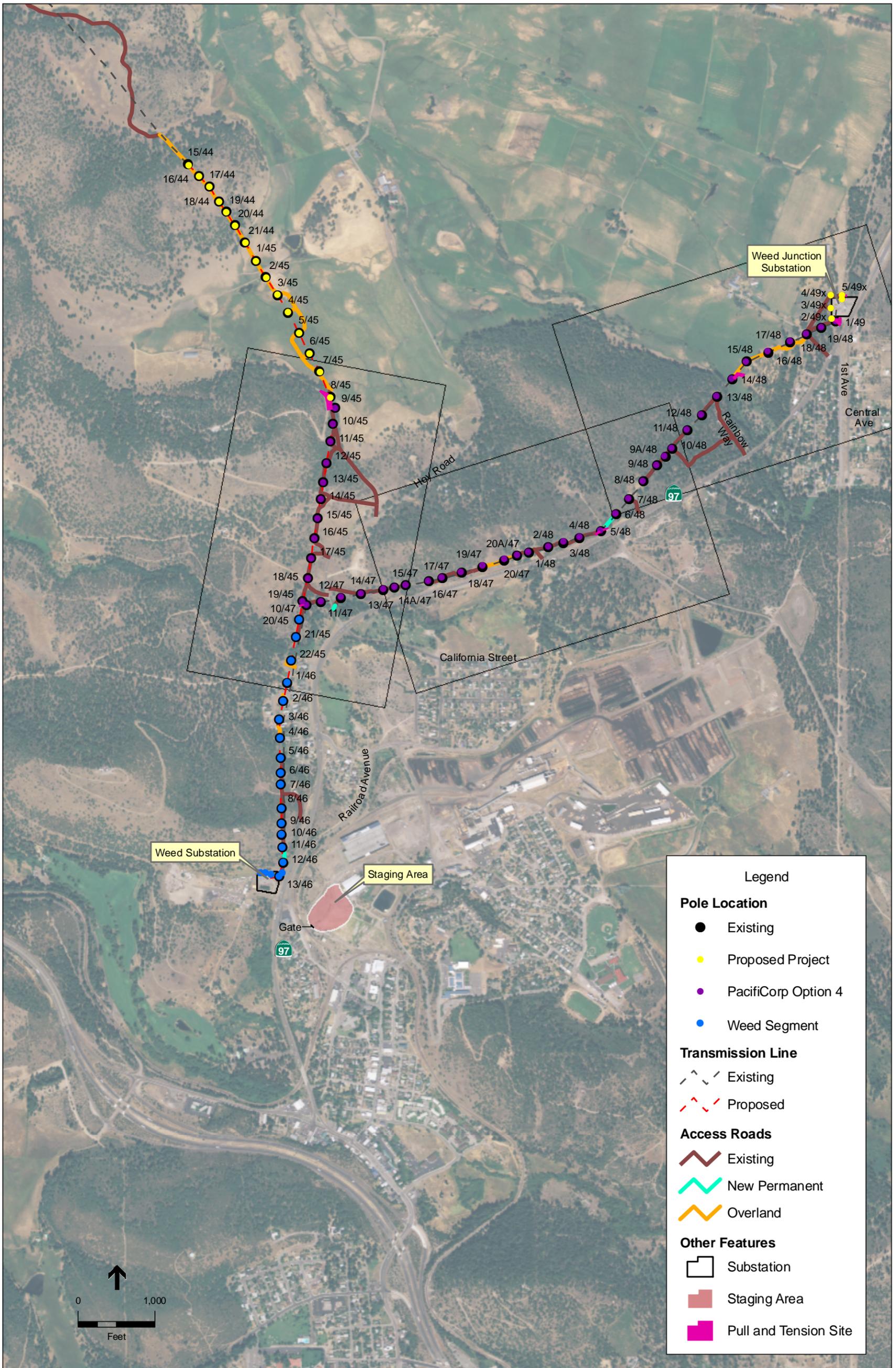
SOURCES: ESA (2007), PacifiCorp (2007)

PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion . 205439

Legend

- | | |
|---|--|
| <ul style="list-style-type: none"> ① Existing ROW (50 feet wide) ② ROW with Option 4 (50 feet wide, shifted 15 feet north) ③ ROW with Option 1 (100 feet wide) ④ ROW with Mackintosh/ALJ Variations A or B, Mackintosh Option 5, and Option 4 - ALJ3 (50 feet wide, same as existing) | <ul style="list-style-type: none"> —●— Existing Pole Location and Transmission Line —●— Option 4 Pole Location and Transmission Line —●— Option 1 Pole Location and Transmission Line |
|---|--|

Figure 3-2
Representative Detail of Alternative Alignments



SOURCES: ESA (2007), PacifiCorp (2007)

PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion . 205439

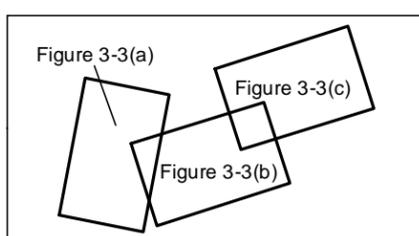
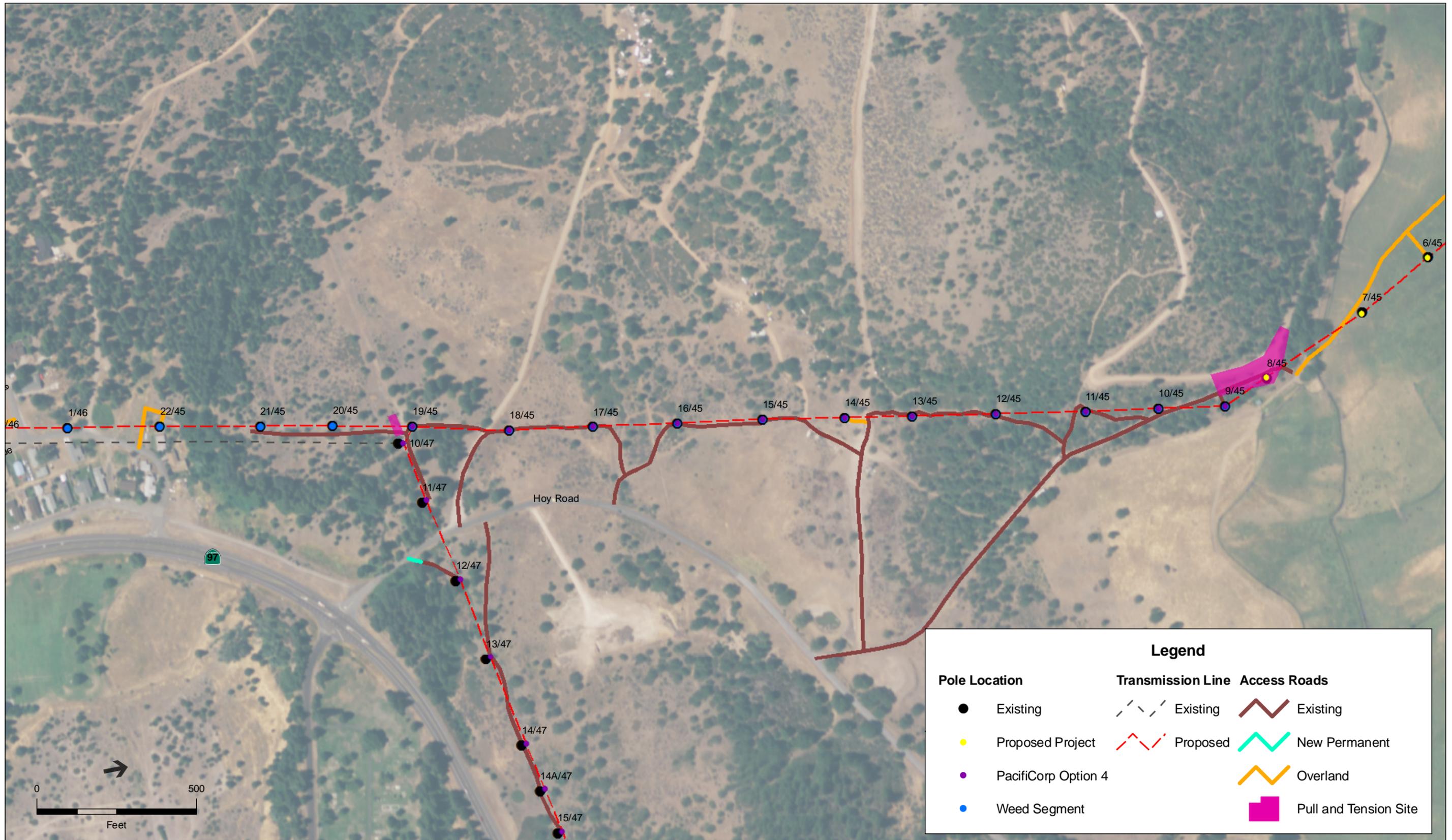
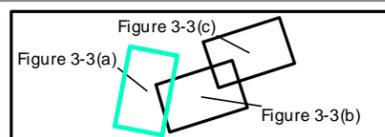


Figure 3-3
PacifiCorp Option 4 Alternative



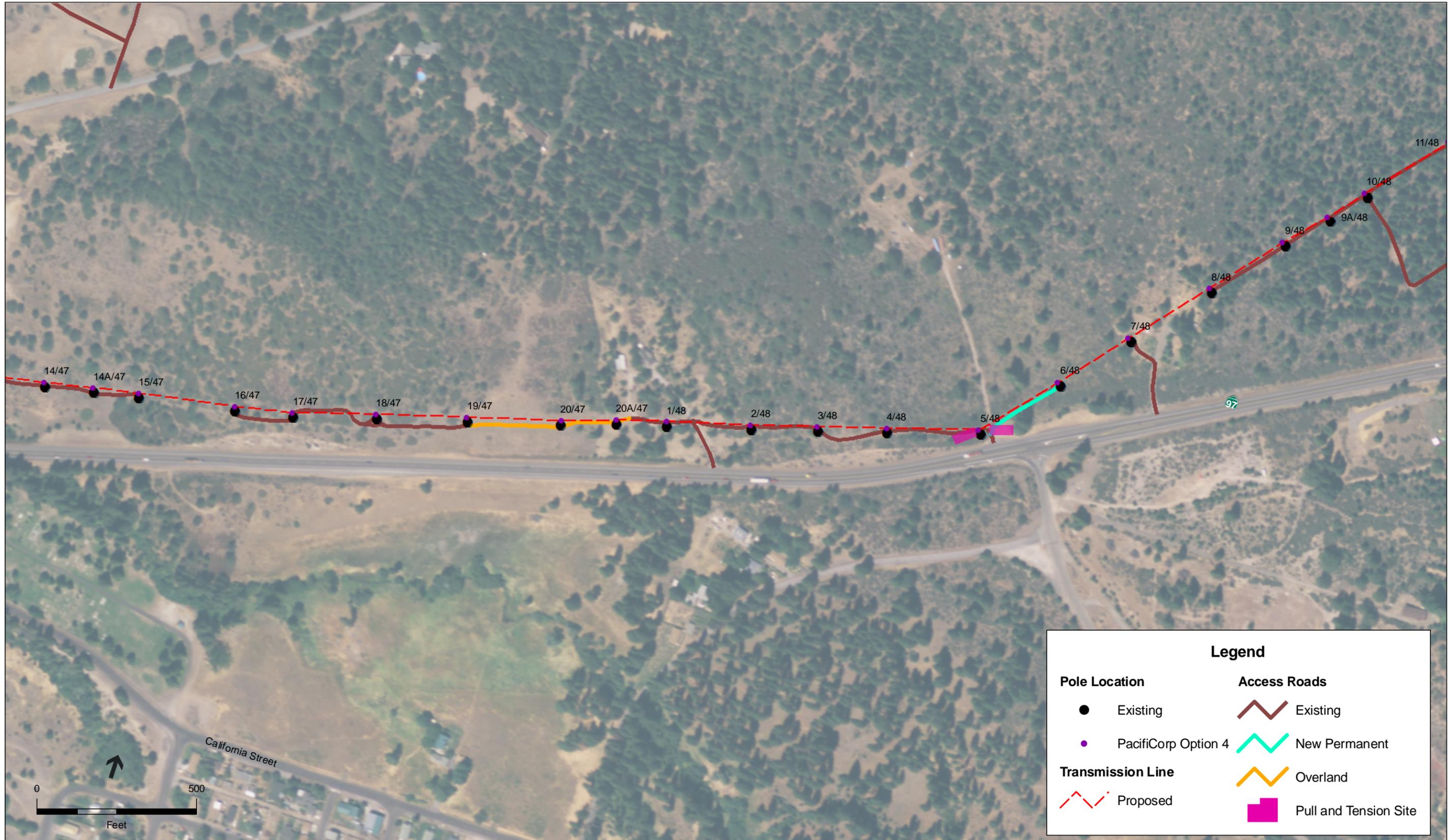
SOURCES: ESA (2007), PacifiCorp (2007)



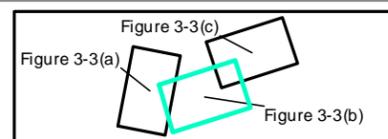
PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 3-3(a)

PacifiCorp Option 4 Alternative



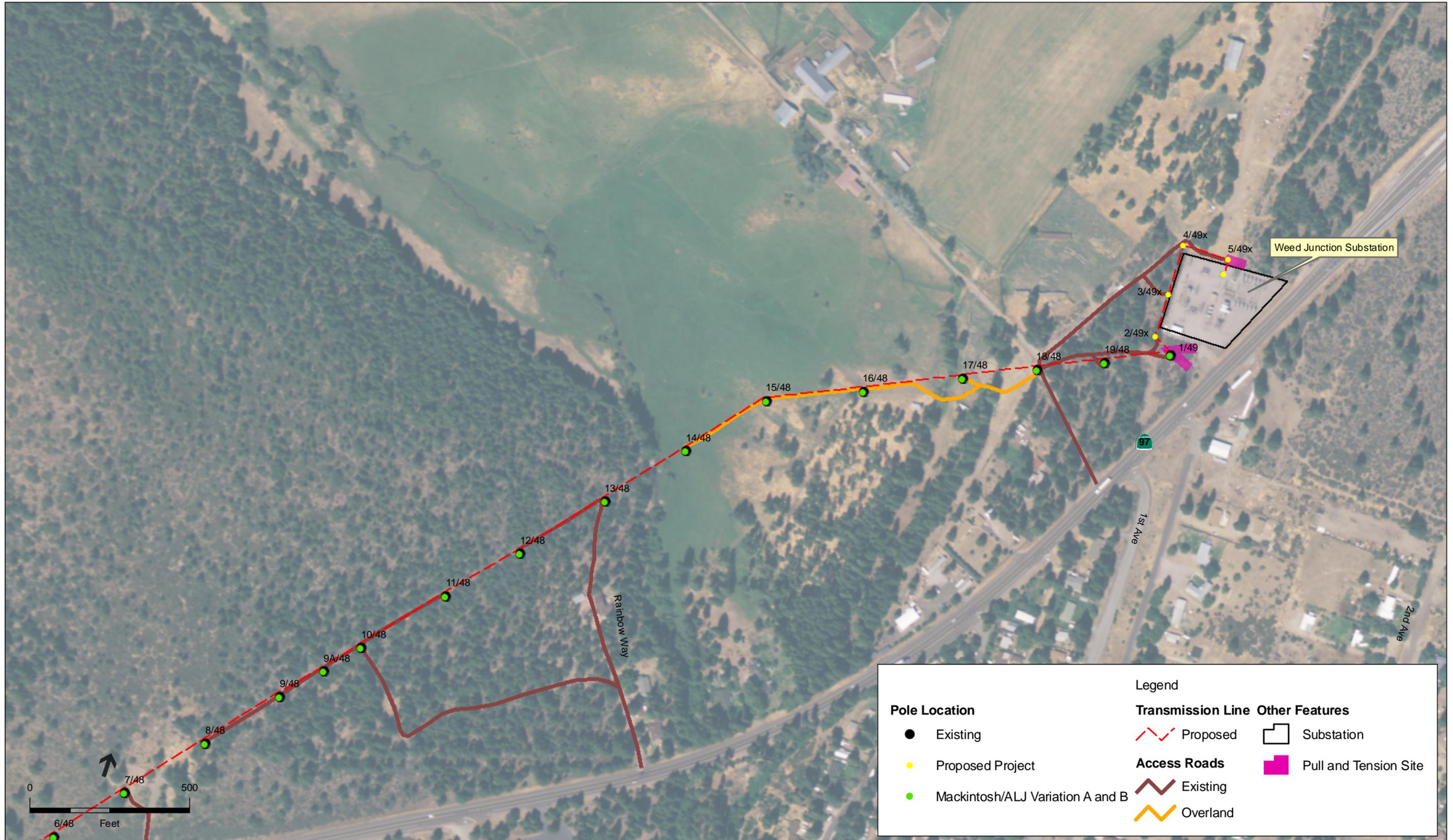
SOURCES: ESA (2007), PacifiCorp (2007)



PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 3-3(b)

PacifiCorp Option 4 Alternative

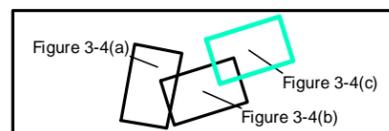


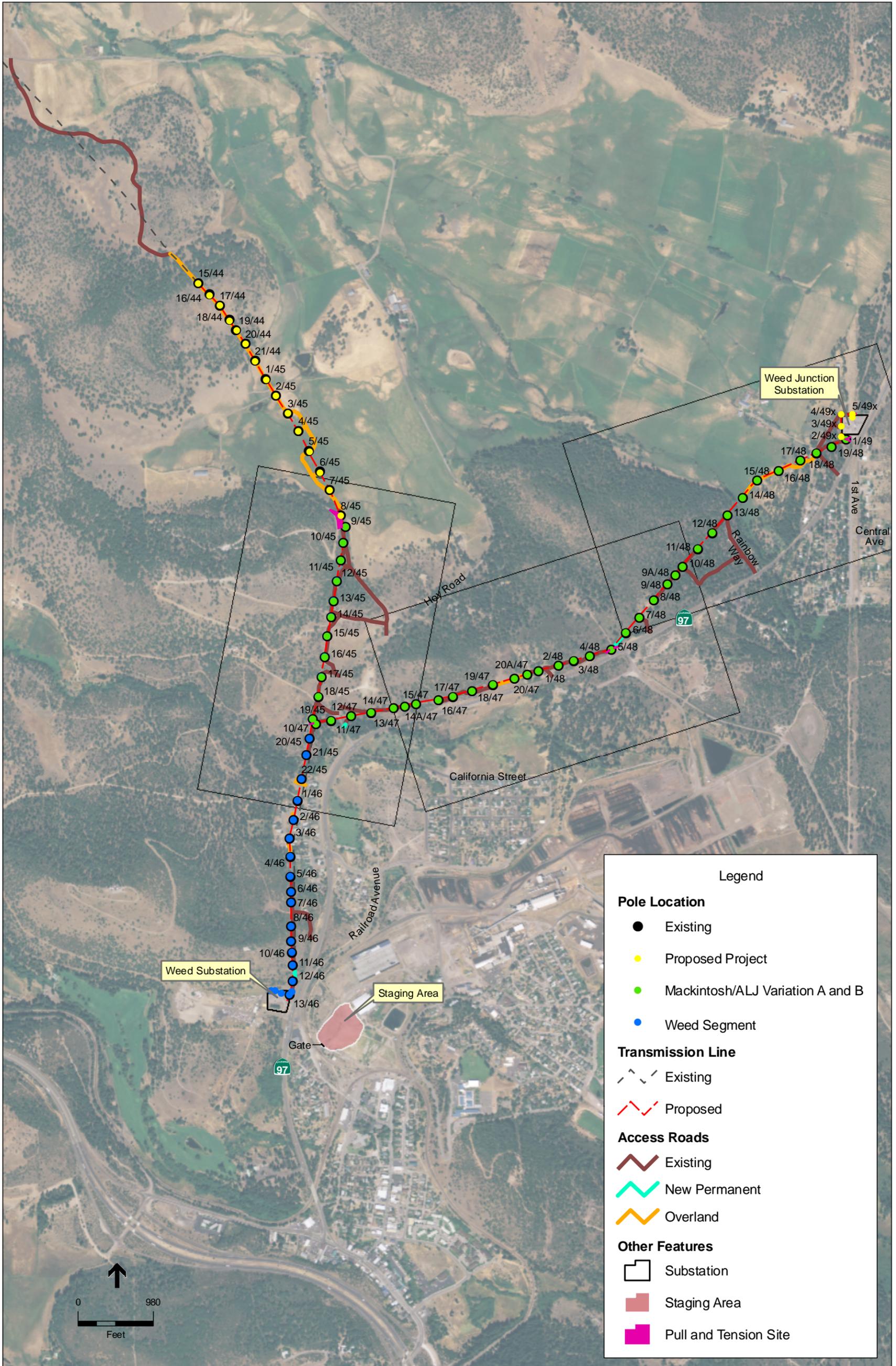
SOURCES: ESA (2007), PacifiCorp (2007)

PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 3-4(c)

Mackintosh/ALJ Variation A and B Alternatives





SOURCES: ESA (2007), PacifiCorp (2007)

PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion . 205439

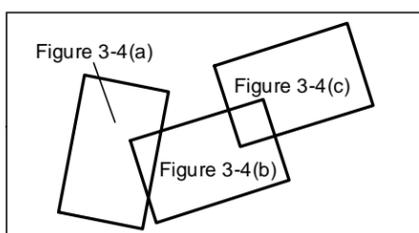
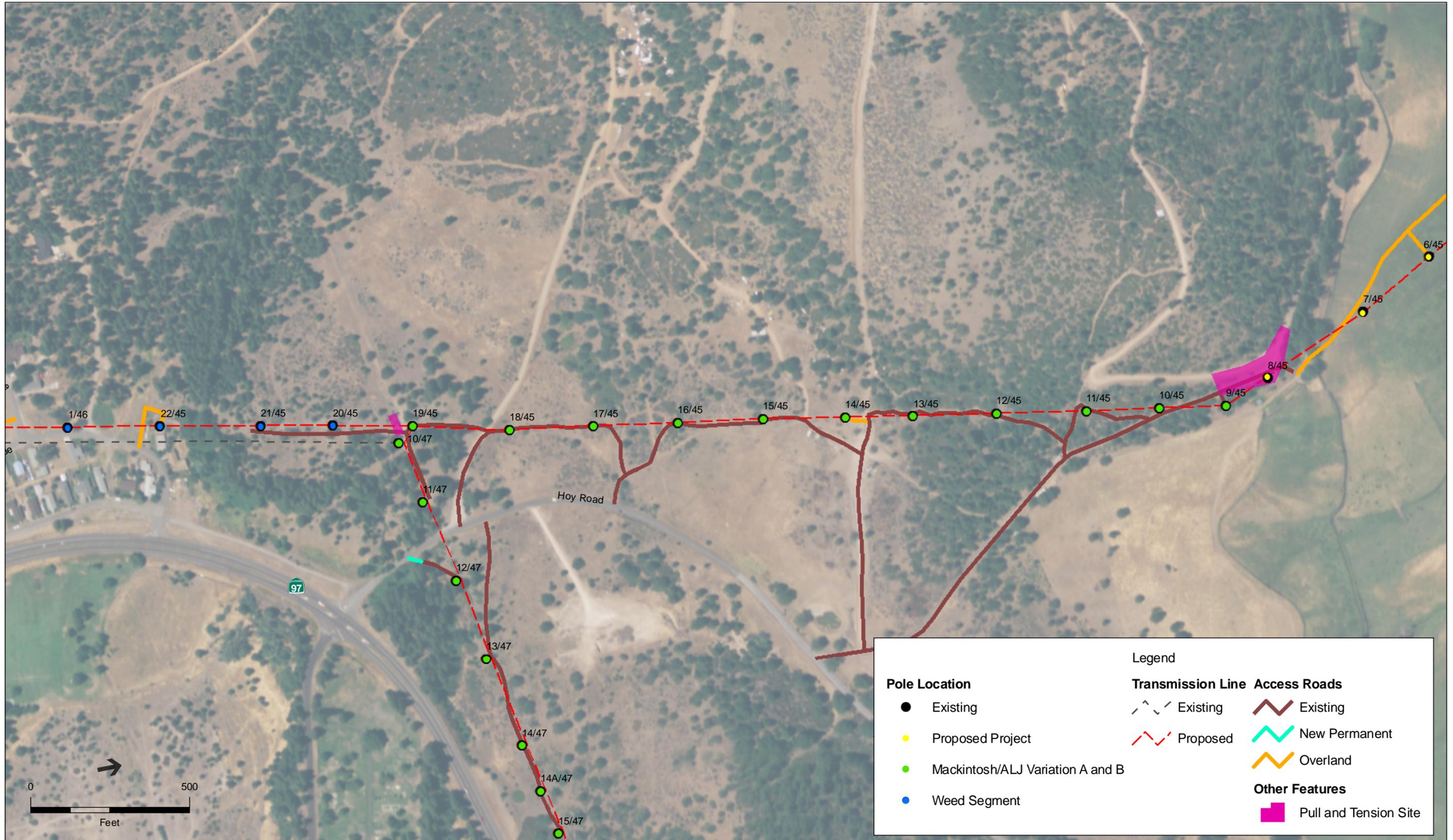
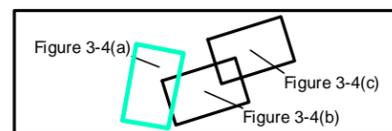


Figure 3-4
Mackintosh/ALJ Variation A and B Alternatives



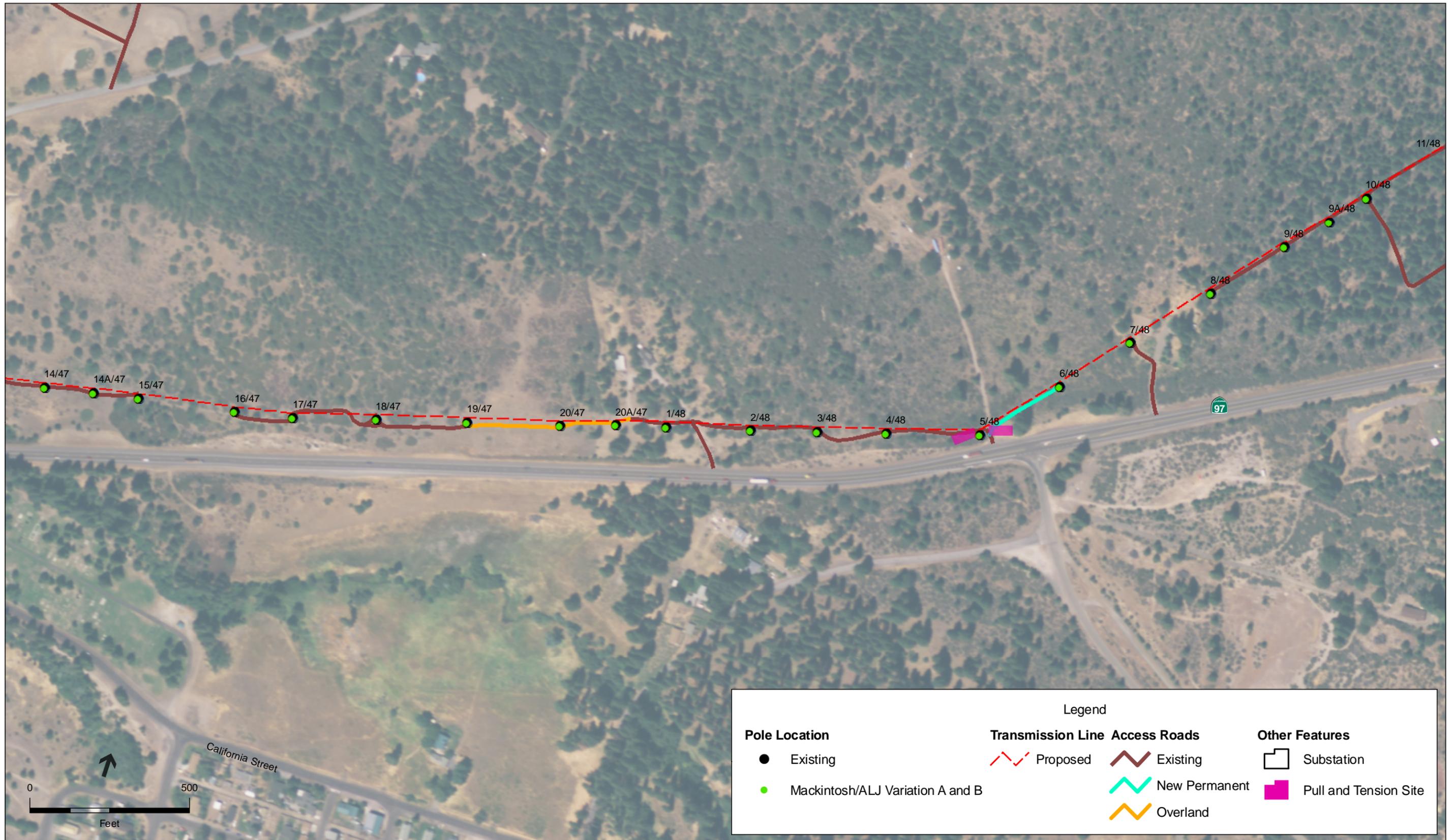
SOURCES: ESA (2007), PacifiCorp (2007)



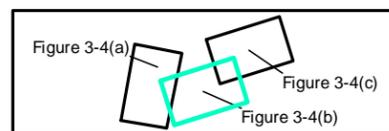
PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 3-4(a)

Mackintosh/ALJ Variation A and B Alternatives



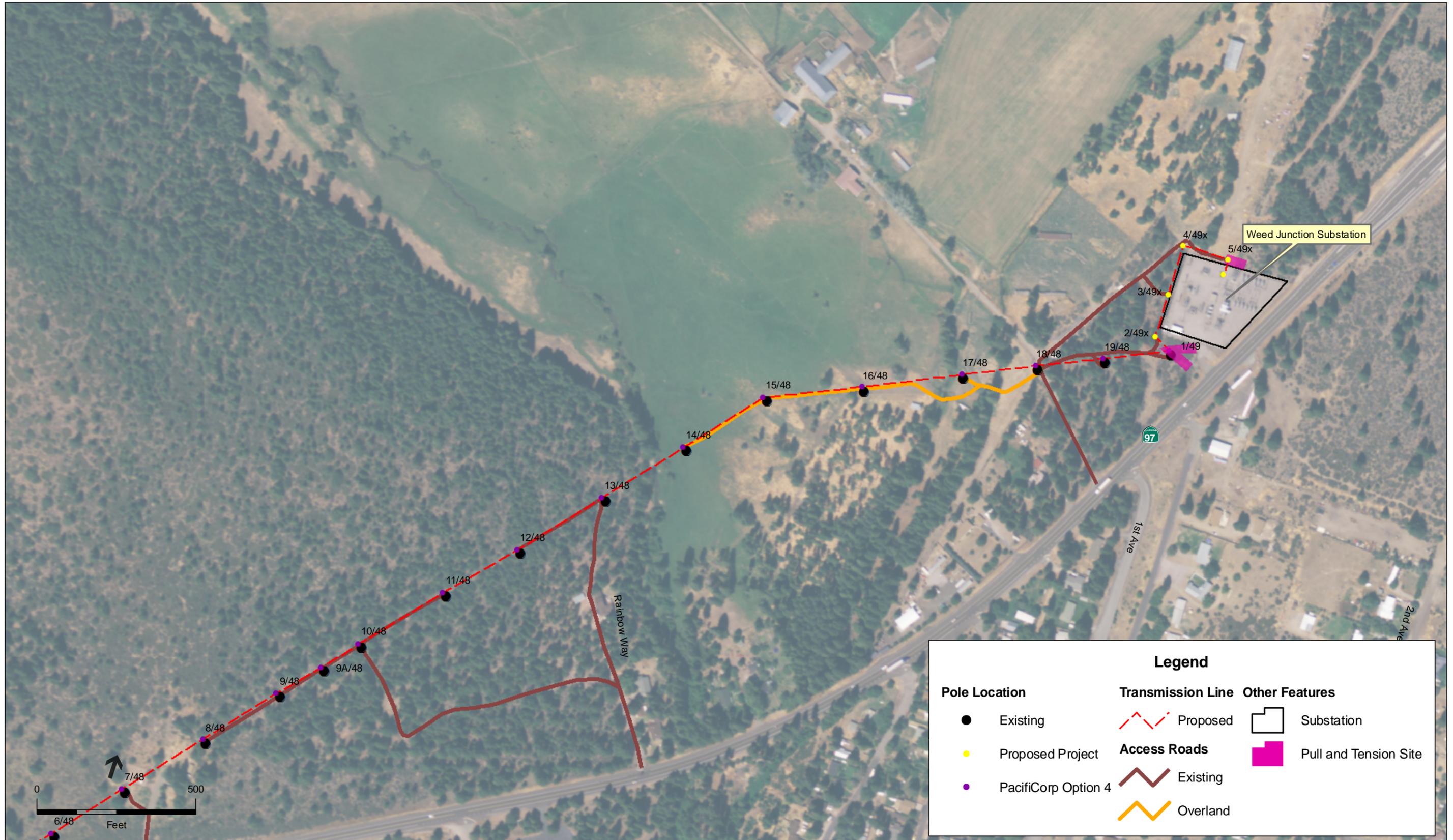
SOURCES: ESA (2007), PacifiCorp (2007)



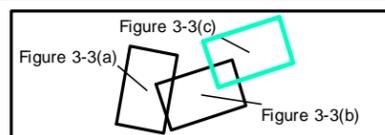
PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 3-4(b)

Mackintosh/ALJ Variation A and B Alternatives



SOURCES: ESA (2007), PacifiCorp (2007)



PacifiCorp's Yreka-Weed Transmission Line Upgrade Project - Southern Portion. 205439

Figure 3-3(c)

PacifiCorp Option 4 Alternative