BNSF/UPRR Mojave Subdivision

Tehachapi Rail Improvement Project

Kern County, California
District 6-Kern-UPRR-Mojave Subdivision
from MP 343.27 to MP 343.64, and MP 352.07 to MP 353.08

Project ID 0000000526
SCH# 2013031048

Draft Environmental Impact Report

Prepared by the
State of California Department of Transportation

October 2013

Caltrans

General Information About This Document

What's in this document?

The California Department of Transportation (Caltrans) has prepared this Draft Environmental Impact Report, which examines the potential environmental impacts of alternatives being considered for the proposed project in Kern County, California. The document describes why the project is being proposed, alternatives for the project, the existing environment that could be affected by the project, potential impacts from each of the alternatives, and proposed avoidance, minimization, and/or mitigation measures.

What should you do?

Please read this document. Additional copies of this document as well as the technical studies are available for review at the Caltrans district office at 855 M Street, Suite 200, Fresno, CA 93721 and the Kern County Library-Tehachapi Branch at 1001 West Tehachapi Boulevard, Suite A-400, Tehachapi, CA 93561. The document can also be accessed electronically at the following website: http://www.dot.ca.gov/dist6/environmental/envdocs/d6.

- Attend the California Environmental Quality Act public hearing/open house on November 7, 2013. Drop in any time from 6:00 to 8:00 in the evening to meet members of the project team, review project maps, and make comments. The meeting will be held in the conference room of the Fairfield Inn and Suites Tehachapi at 422 W. Tehachapi Boulevard in Tehachapi, California.
- We welcome your comments. If you have any concerns about the project, please attend the public hearing, or send your written comments to Caltrans by the deadline. Submit comments via U.S. mail to Caltrans at the following address:

  Kelly J. Hobbs, Senior Environmental Planner
  Environmental Division
  California Department of Transportation
  855 M Street, Suite 200
  Fresno, CA 93721

- Submit comments via email to: kelly.hobbs@dot.ca.gov.
- Submit comments by the deadline: 11/21/2013.

What happens next?

After comments are received from the public and reviewing agencies, Caltrans may 1) give environmental approval to the proposed project, 2) do additional environmental studies, or 3) abandon the project. If the project is given environmental approval and funding is appropriated, Caltrans could design and build all or part of the project.

Printing this document: To save paper, this document has been set up for two-sided printing (to print the front and back of a page). Blank pages occur where needed throughout the document to maintain proper layout of the chapters and appendices.

For individuals with sensory disabilities, this document is available in Braille, in large print, on audiocassette, or on computer disk. To obtain a copy in one of these alternate formats, please call or write to Caltrans, Attn: Kelly J. Hobbs, Environmental Division, 855 M Street, Suite 200, Fresno, CA 93721; (559) 445-5286 Voice, or use the California Relay Service TTY number (559) 488-4066 or 711.

SCH# 2013031048
DISTRICT 6 – KERN – UNION PACIFIC RAILROAD/MOJAVE SUBDIVISION
(from mile posts 343.27 to mile posts 343.64, and 352.07 to mile posts 353.08)

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Construct an additional track along two rail segments within the Tehachapi Pass area

DRAFT ENVIRONMENTAL IMPACT REPORT

Submitted Pursuant to: (State) Division 13, California Public Resources Code (Sec. No. 21000 et al.)

THE STATE OF CALIFORNIA
Department of Transportation

10-4-13
Date of Approval

CHRISTINE COX-KOVACEVICH
Chief, Central Region
Environmental Division
California Department of Transportation
CEQA Lead Agency

Executive Summary

Introduction

This environmental impact report proposed for the BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project, funded by Transportation Corridor Improvement Funds and the BNSF, describes the potential impacts and mitigation related to construction of an additional track along two rail segments within the Tehachapi Pass area. The project would also extend existing culverts. Three alternatives are under consideration: the Build Alternative, the Reduced-Segment Alternative, and the No-Build Alternative.

The project consists of two segments north of State Route 58 and State Route 223, running through the towns of Caliente and Keene. Traveling from west to east, the project would add a second rail segment parallel to existing track ("double track") at the following segment locations (listed in priority order):

- 1.01 miles from Walong to Marcel (mile posts 352.07-353.08)
- 0.37 mile through the Cliff Siding Extension (mile posts 343.27-343.64)

Purpose and Need

The project is needed to address operational constraints that are currently being experienced throughout the Tehachapi Pass. Rail service through the Tehachapi Pass is experiencing a growing volume of rail traffic, worsening congestion, and increased delays. Rail volumes through the Tehachapi Pass have greatly increased in the past decade due to growth in the volume of goods transported through the region to destinations in the Midwest and South. In addition to rail transportation, the only major means of access across the Tehachapi Mountains between the Central Valley and eastern points such as Las Vegas and Phoenix is through State Route 58, a four-lane expressway with traffic controls in many segments. About 30 percent of the traffic on this portion of this expressway is truck traffic. Rapid growth in Bakersfield in recent years has also added traffic and congestion. This trend is expected to continue.

The purpose of the project is to:

- Reduce operational constraints such as train stacking and idling that limit the efficiency of rail freight movement through the Tehachapi Trade Corridor.
- Improve operational capacity above the current level of sustainable capacity to increase efficiencies along the Tehachapi Trade Corridor and respond to projected freight volume growth.
- Improve overall statewide air quality by reducing truck traffic through greater rail capacity.

Project Funding

The Tehachapi Rail Improvement Project is a public-private partnership project that would be funded by State of California and BNSF. The project is one of five critical freight movement projects identified by the State of California.

The estimated cost for the project is $26 million (2013 dollars). The BNSF would partner with the State of California on this rail project to provide matching funds to cover the project costs. Half of the construction funding would come from BNSF and the rest from the California Transportation Commission for this freight transport improvement work along the Tehachapi Trade Corridor. In addition to the 50 percent private match, future maintenance of the new rail infrastructure would be privately funded by the railroads.

The public half of the funding would come from Transportation Corridor Improvement funds, a portion of Proposition 1B-designated funds. Proposition 1B authorizes the State to fund transportation projects with bonds to relieve congestion, improve the movement of goods, improve air quality, and enhance the safety and security of the transportation system with project components that add to the efficiency and capacity of the freight rail system. This project is eligible for funding because it would improve the movement of goods through the Tehachapi Pass by relieving congestion, enhancing the safety and security of the transportation system, and improving the efficiency and capacity of the freight rail system.

Because the California Transportation Commission must approve the designated Transportation Corridor Improvement Funds, the California Environmental Quality Act must be applied to this project and an environmental impact report must be prepared.

Project Impacts

Three alternatives—a Build Alternative, Reduced-Segment Alternative, and No-Build Alternative—are being considered for the project. Results of this environmental impact report for the Tehachapi Rail Improvement project are summarized in Table S-1. Potential impacts are fully discussed in Chapter 2.

Table S-1 Summary of Potential Environmental Impacts from Alternatives

Potential Impact	Build Alternative	Reduced-Segment Alternative	No-Build Alternative
Human Environment			
Land Use	Permanent: 0.70 acres of land acquisition Temporary: 5.33 acres of land acquisition	Permanent: 0.66 acres of land acquisition Temporary: 2.09 acres of land acquisition	No impact to land use would occur.
Farmlands	Permanent: 0.66 acres of farmland. Temporary: 2.46 acres of farmland.	Same impacts as Build Alternative.	No impact to farmland would occur. Farmland would stay as grazing land.
Public and Emergency Services	Potential minor temporary impacts to emergency access. Delays from gate-down times could be up to 53 seconds.	Potential minor temporary impacts to emergency access. Delays from gate-down time could be up to 29 seconds	No impact anticipated. Train operations would continue as they do now; no additional public or emergency services would be required. Increased gate-down times would occur as rail demand increases.
Traffic and Transportation	Longer trains would result in increased gate-down times. However, these impacts are relatively minor. Reduction in traffic may also occur on other roads due to increased freight capacity in the Tehachapi Trade Corridor. As a result of increased rail capacity, up to 1,125 trucks could be removed from State Route 58.	Same impacts as compared to Build Alternative, but 330 fewer trucks have the potential to be removed from State Route 58.	Rail traffic on the Tehachapi line would be considered “at-capacity” on an average freight movement day, and “above capacity” on peak freight movement days. All freight that would need to be transported in excess of the actual rail capacity would have to be transported by truck and would exacerbate projected traffic volumes along State Route 58.
Visual and Aesthetics	Minor impacts to oak woodlands scenic resources would occur along the Walong to Marcel Segment. Most locations are remote from viewers. Removed oak trees would be replaced consistent with applicable regulations.	Same impacts as Build Alternative.	No impact anticipated. Train operations would continue as they do now; no new visual or aesthetic impacts would occur.
Cultural Resources	There are no anticipated impacts to sites due to avoidance measures.	Same impacts as Build Alternative.	No new area would be disturbed; therefore, no impacts to areas containing potential cultural resources would occur.
Physical Environment			
Hydrology and Floodplain	There would be a negligible change in pre- and post-construction storm flows. Seven culverts would be modified to accommodate the increased right-of-way.	Similar impacts as Build Alternative. Four culverts would be modified to accommodate the increased right-of-way.	No impacts to hydrology or floodplain. Conditions would remain the same.
Water Quality	Dust created during construction could pose potential impacts to water bodies; however, such impacts would be minimal with implementation of best management practices.	Same impacts as Build Alternative.	No impact anticipated. No new area would be disturbed; existing conditions would remain unchanged. No impacts to water quality would occur.

Potential Impact	Build Alternative	Reduced-Segment Alternative	No-Build Alternative
Geology/Soils/ Seismic/Topography	Minimal impacts with implementation of minimization measures.	Same impacts as Build Alternative.	No impacts to geology, soil, or topography are anticipated. All seismic issues would remain unchanged.
Paleontology	There are no known resources impacts. Monitoring measures would be included to protect unknown resources.	Same impacts as Build Alternative.	No impact anticipated. The train would continue to run in an existing, already-disturbed rail corridor. No additional adverse impacts are anticipated.
Hazardous Waste or Materials	Compliance with OSHA requirements and elements of the blasting plan would minimize impacts during construction.	Same impacts as Build Alternative.	No impact anticipated. Current train operations would continue; no exposure to new hazardous waste or materials sources would occur.
Air Quality	The Build Alternative would result in a beneficial impact to air quality from expanded use of less polluting trains as compared to trucks, reduction of delays on the existing track, reduction of traffic congestion on roadways by foregoing cargo transport by trucks, and a reduction in roadway maintenance activities.	The Reduced-Segment Alternative would result in less of a beneficial impact than the Build Alternative to air quality due to the lower number of trains enabled by this alternative.	The No-Build Alternative would result in the most emissions of the analyzed alternatives when the existing Tehachapi Trade Corridor tracks reach capacity. Higher air pollutant emissions from this alternative are associated with cargo movement by increased volume of trucks and a greater need for roadway maintenance/construction.
Noise and Vibration	Receptors would see a 0.1- to a 1.0-dBA increase in ambient level noise.	Noise impacts would be less compared to Build Alternative.	Noise conditions would remain the same.
Biological Resources Environment			
Natural Communities	The project would result in a small and limited impact to natural communities as a result of construction and operation of the new track. Temporary impact: 6.3 acres. Permanent impact: 10.01 acres. A Native Vegetation Restoration and Monitoring Plan shall be implemented. Impacts would occur to oak trees; replanting would occur at a 3-acre-to-1-acre ratio.	Similar impacts as Build Alternative.	No impact anticipated. Train operations would remain as they are now, and no impacts to natural communities would occur.
Wetlands	The project would not temporarily or permanently affect jurisdictional or non-jurisdictional wetlands.	Same impacts as Build Alternative.	No impact anticipated. Train operations would remain as they are now, and no impacts to wetland areas would occur.
Plant Species	The project would result in a small and limited impact to local tree, shrub, plant, and other native tree species in the biological study area. No special-status, threatened, or endangered species would be affected.	Impacts are similar to the Build Alternative. No special-status, threatened, or endangered species would be affected.	No impact anticipated. Train operations would remain as they are now, and no impacts to plant species would occur.

Coordination with Public and Other Agencies

The following permits, reviews, and approvals would be required for project construction:

Table S-2 Permits and Approvals Needed

Agency	Permit/Approval	Status
San Joaquin Valley Air Pollution Control District	Asbestos and Disposal Permit	To be obtained before project grading
Caltrans and County of Kern Public Works Department	Stormwater Pollution Prevention Plan	To be obtained before project grading
County of Kern Roads Department	Construction-related Road Closure Permit	To be obtained during project construction, 5 working days before need for road closure/detour
California Public Utilities Commission	Grade-crossing Permit (GO-88B)	To be obtained before start of construction for each project segment
Caltrans	Extra-legal Permit	To be obtained before start of construction

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures, and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including project development team meetings, interagency coordination meetings, and correspondence exchange. The following concerns have been raised about the project through various coordination meetings and correspondence:

- Impact to air quality from train emissions.
- Impacts to emergency response, specifically within the City of Tehachapi, as a result of a higher volume of longer trains that would travel through the corridor once the project has been completed.
- Impacts to adjacent roadways as a result of increased gate-down times associated with higher volume of longer trains.
- The City of Tehachapi's perceived need for a grade separation within the city.
- Impacts to noise as a result of longer trains.
- Impacts to the National Chavez Center.
- All impacts are discussed in detail in Chapter 2 of this Environmental Impact Report.

A former railroad infrastructure improvement project had been originally proposed by BNSF. The former project would have double-tracked five of the nine single-track segments in the Tehachapi Pass. This proposal, however, was recently removed from consideration, and a new

and reduced project is now proposed. This new project double-tracks only two of the single-track segments within the Tehachapi Pass, which will result in 1.38 miles of new track.

Pursuant to Section 21159.27 of the California Environmental Quality Act Guidelines, this is not an attempt by Caltrans or BNSF to divide the project into smaller projects with lesser environmental impacts. Due to an over-commitment of Transportation Corridor Improvement Funds, the project could not be carried forward as it was previously proposed and was thus three segments were removed from the scope of the project. A Notice of Preparation for this project was filed on March 14, 2013, and a Notice of Cancellation (NOC) for the five-segment project was filed through the State Clearinghouse (SCH) on March 25, 2013. In addition, copies of the Public Notice were sent to all applicable local agencies and elected officials to provide clarification that the former project had been cancelled and would not receive further consideration.

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List of Abbreviated Terms

BNSF	BNSF Railway
Caltrans	California Department of Transportation
CEQA	California Environmental Quality Act
dBA	decibels
LOS	Level of Service
mph	miles per hour
UPRR	Union Pacific Railroad
MP	mile post
TTC	Tehachapi Trade Corridor

Chapter 1 Proposed Project

1.1 Introduction

The BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement project would construct an additional track (provide "double-tracking") along two bottlenecked rail segments in the Tehachapi Pass between Bakersfield and Mojave, California. The project would also extend existing culverts. Figure 1.1-1, Regional Project Vicinity Map, shows the project location and surrounding area.

The Bakersfield-to-Mojave route is mostly double-tracked, except for nine single-track segments paralleling State Route 58 through the Tehachapi Pass. This project would double-track two of the nine single-track segments as shown in Figure 1.1-2. The two segments, as shown in Figure 1.1-3, are 1.01 miles and 0.37 mile long, respectively, for a total of 1.38 miles. The two segments are 8.48 miles apart.

Going from west to east, the project would add the second rail segment parallel as follows, in order of priority:

- 1.01 miles of new double track connecting the existing double track west of Walong to the existing double track east of Marcel (mile posts 352.07 to 353.08). Tunnel 10 would remain and be bypassed.
- 0.37 mile of new double track extending the existing double track Cliff Siding on the west and merging back to single track prior to entering the existing tunnel on the east (mile posts 343.27 to 343.64). This segment includes Tunnel 7, which is just outside the construction limits of this segment.

Primary funding for the project would come from Transportation Corridor Improvement funds, a portion of Proposition 1B-designated funds. Proposition 1B authorizes the State to fund transportation projects with bonds to relieve congestion, improve the movement of goods, and improve air quality, with project components that add to the efficiency and capacity of the freight rail system. The project is eligible for funding because it would improve the movement of goods through the Tehachapi Pass by relieving congestion, enhancing the safety and security of the transportation system, and improving the efficiency and capacity of the freight rail system.

1.1.1 Purpose

The State of California has identified the project as a critical rail project. The project area is experiencing increased rail traffic volume, congestion, and delays. Rail volumes through the

Tehachapi Pass have greatly increased in the past decade due to growth in the volume of goods transported through the region. As identified in the Tehachapi Trade Corridor Project Application, the corridor is already experiencing capacity constraints. Operational challenges in the Tehachapi Pass include a steep mountain grade (2 to 2.5 percent), 11 tunnels, single-track through some of the corridor, and a high volume of daily rail traffic. The project is located in a primary freight corridor that is expected to experience continued growth. This growth will result in additional capacity constraints, which compromises the operational and economic effectiveness of this freight corridor.

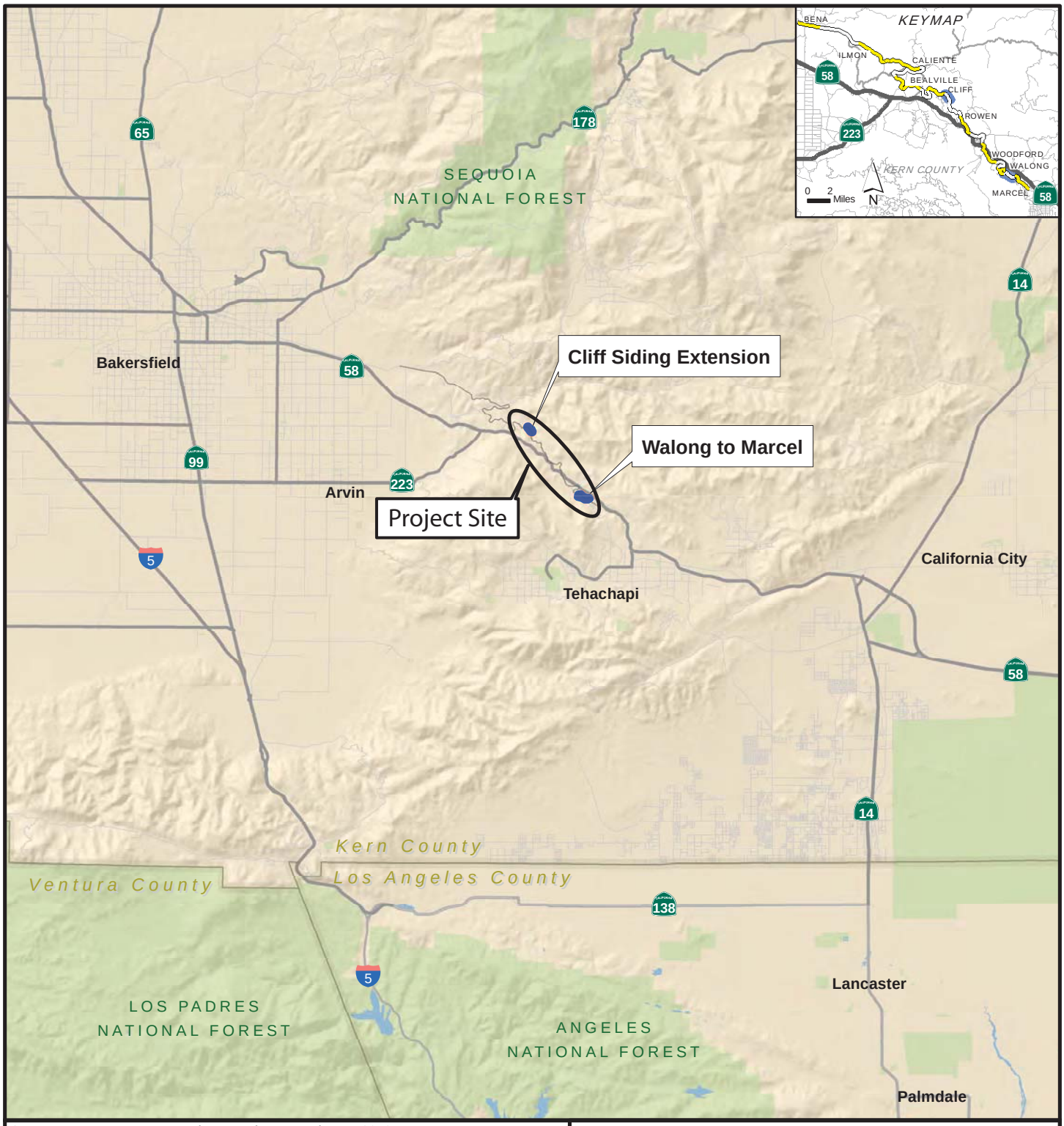
In addition to rail transportation, State Route 58 provides the other significant means of access across the Tehachapi Mountains between Central California and Southern California and states to the east, such as Nevada and Arizona. About 30 percent of the traffic on this portion of State Route 58 is truck traffic (Kern County Truck Study 2005). Rapid growth in Bakersfield in recent years has also added traffic along major routes going through the Bakersfield metropolitan region to the Mojave area, and this growth is expected to continue. The project would help relieve this bottlenecked rail corridor. It would provide reliable and efficient freight transportation, improve movement of freight through the Tehachapi Mountains, and decrease truck freight traffic along State Route 58 and adjacent local roadways.

Construction of the double track along the two segments of the Tehachapi Pass would help meet the objectives of the project by achieving the following:

- Reducing operational constraints such as train stacking and idling that limit the efficiency of rail freight movement through the Tehachapi Trade Corridor.
- Improving operational capacity above the current level of sustainable capacity to increase efficiencies along the Tehachapi Trade Corridor and respond to projected freight volume growth.
- Improving overall statewide air quality by reducing truck traffic through greater rail capacity.

1.1.2 Need

The project is needed because the current track operation is at a level considered near or at capacity. Railroad congestion levels are calculated by using a volume-to-capacity ratio that is segmented into levels of service (LOS). Actual rail traffic volume is divided by track segment into a measurement ratio based on the segment's sustainable maximum capacity.



Sources: JL Patterson & Associates; Esri Maps and Data, 2013

Legend

- Proposed Double Track Extension
- Tehachapi Corridor

0 10 Miles

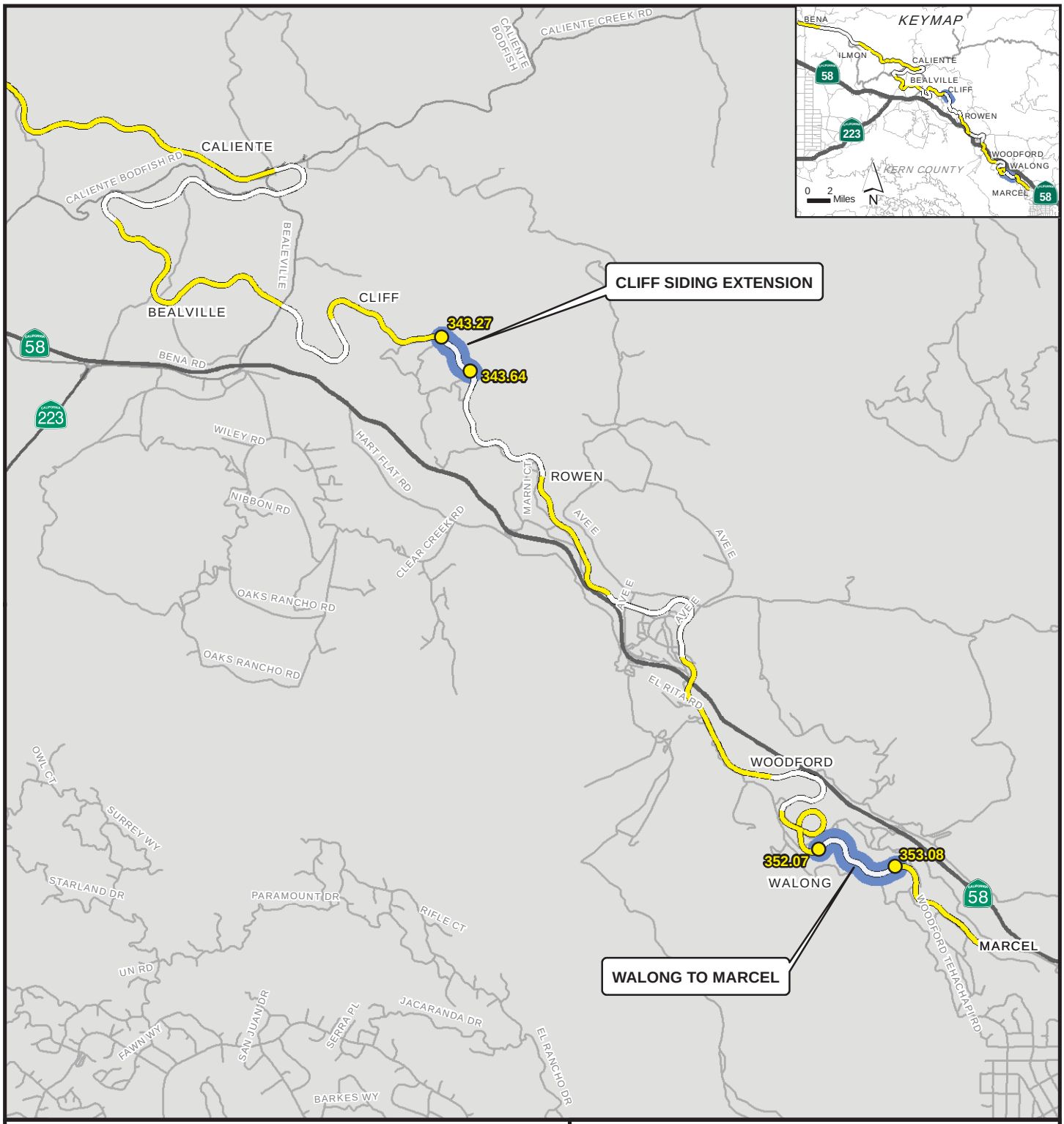
BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Regional Project Vicinity Map

March 2013

Figure 1.1-1

Caltrans



Sources: JL Patterson & Associates; Esri Maps and Data, 2013

Legend

BNSF TEHACHAPI

- Segment Milepost
- Project Segments
- Existing Single Track Not in Project
- Existing Double Track Not in Project
- Highway
- Road

0 1.3 Miles

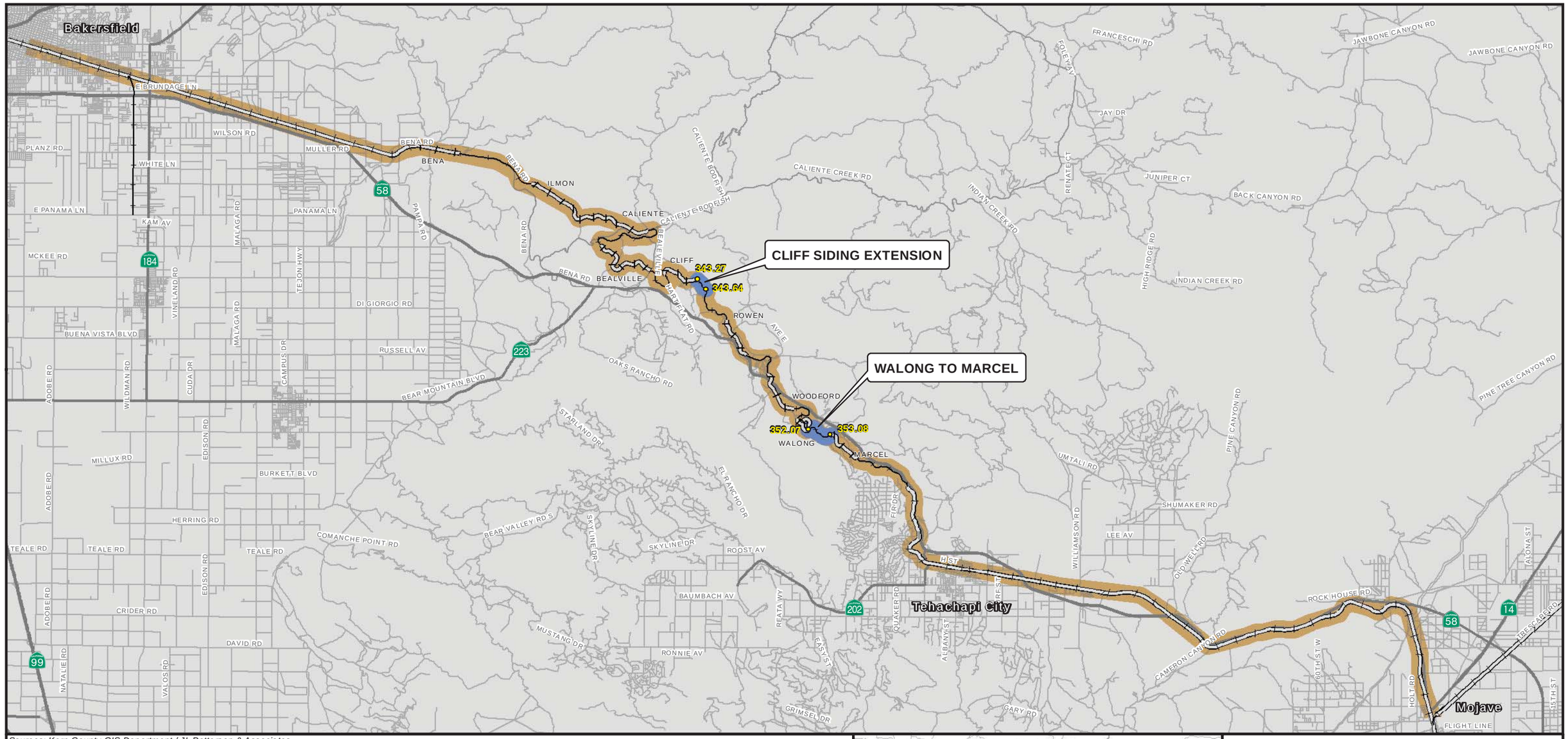
BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Project Segment/Milepost Map

March 2013

Figure 1.1-2

Caltrans



Sources: Kern County GIS Department / JL Patterson & Associates

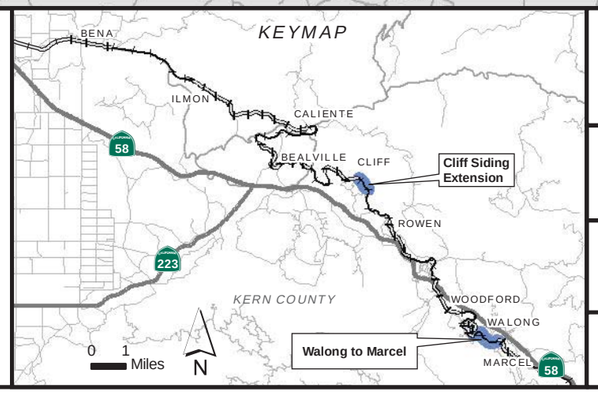
Legend

BNSF TEHACHAPI

- Segment Milepost
- Project Segments
- Existing Single Track Not in Project
- Existing Double Track Not in Project
- Tehachapi Corridor
- Highway
- Road

0 3 6

Miles



BNSF/UPFF Mojave Subdivision Tehachapi Rail Improvement Project

Tehachapi Corridor

March 2013

Figure 1.1-3

Caltrans

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According to the Association of American Railroads, rail corridors operating at an LOS of A, B, or C are those operating at or below capacity; train flows are carried with sufficient unused capacity to accommodate maintenance work and recover quickly from incidents such as weather delays, equipment failures, and minor accidents. Corridors operating at LOS D are operating at near capacity; heavy train flows are carried with only moderate capacity to accommodate maintenance and recover from incidents. Corridors operating at LOS E are operating at capacity; very heavy train flows are carried at very limited capacity to accommodate maintenance and recover from incidents without substantial service delays. Corridors operating at LOS F are operating above capacity; train flows are unstable, and congestion and service delays are persistent and substantial. The railroad LOS grades and descriptions correspond generally to the LOS grades used in highway system capacity studies, and are shown in Table 1.1-1.

Freight Movement Trends

According to the 2013 Association of American Railroads' *Overview of America's Freight Railroads*, the demand for freight transportation will grow from 17.6 billion tons in 2011 to 28.5 billion tons in 2040, a 62 percent increase. Railroads must add capacity to handle approximately 88 percent more tonnage to absorb the anticipated growth (AAR, 2007).

The growth of the rail freight system in California has been identified as a crucial element in the future of goods movement within the state. The September 2007 *Goods Movement Action Plan*, prepared by the Business, Transportation, and Housing Agency, and the EPA and the California State Rail Plan–2007-08 to 2017-18 both include the BNSF Tehachapi Rail Capacity Improvement project for expanding capacity along a major rail corridor. The State Rail Plan identified the Tehachapi Pass line between Bakersfield and Mojave as a bottleneck and noted the need to increase traffic volumes.

The *SF Bay Area Containerized Cargo Outlook* (Tioga, 2009) indicates that freight flows in and out of Northern California are expected to grow over 5 percent annually, indicating a need for the project to move goods between Northern California and Southern California and points east. The corridor primarily serves customers in Northern California with 90 percent of the corridor's volume to and from Northern California. The Association of American Railroads indicates that the Tehachapi Trade Corridor is operating at LOS E (at capacity). Projections for rail traffic demand on the Tehachapi Trade Corridor indicate an increase from 30 to 80 trains per day from 2005 and 2035; such growth in volume cannot be accommodated under current rail conditions.

According to the U.S. Environmental Protection Agency (EPA) report *Intermodal Shipping, A Glance at Clean Freight Strategies* (EPA, 2006), rail is considered to be environmentally

superior to trucks for goods movement trips over 500 miles. According to *The Economic Impact of America's Freight Railroads* (AAR, 2012), cost rates for U.S. freight rail were 45 percent lower in 2011 than in 1981, making rail a more cost-effective method than trucks for transporting heavy and/or large volumes of materials. Per EPA studies, the economic breaking point where shipping by rail becomes a more economic choice than trucking is within the range of 450 to 500 miles. The EPA study concludes, "Intermodal transport is an attractive option for shipments over 500 miles." Therefore, a large number of long-haul trucks would be removed from California roadways, including State Route 58, as a result of the project. The potential to move to rail is currently limited by rail traffic congestion, track capacity, and the economic breakpoint to convert from truck to train. By addressing the current track capacity, the project would allow for increased rail freight movement along the Tehachapi Pass and a lesser volume of trucks would be required to respond to increasing freight demand. With fewer trucks on the road, an improvement in air quality would be expected to occur throughout the state.

Table 1.1-1 Volume-to-Capacity Ratios and Level of Service Grades

LOS Grade	Description		Volume/Capacity Ratio
A	Below Capacity	Low to moderate train flows with capacity to accommodate maintenance and recover from incidents	0.0 to 0.2
B			0.2 to 0.4
C			0.4 to 0.7
D	Near Capacity	Heavy train flow with moderate capacity to accommodate maintenance and recover from incidents	0.7 to 0.8
E	At Capacity	Very heavy train flow with very limited capacity to accommodate maintenance and recover from incidents	0.8 to 1.0
F	Above Capacity	Unstable flows; service breakdown conditions	> 1.00

Source: Association of American Railroads, 2007

Insufficient Operational Capacity

Maximum capacity of the existing main track configuration through the Tehachapi Pass is 50 trains per day, the equivalent of 48 6,000-foot trains and 2 8,000-foot trains per day. The number of trains currently passing through the area varies with economic conditions, shipping volumes at the ports, seasonal variations, crop and mining cycles, and other factors. Fifty trains, equal to about 14,000 containers, have been determined to be the maximum number that can operate along the Tehachapi Pass on a given day. With a current average of 35 trains per day, and a current maximum capacity of 50 trains per day, the Tehachapi Trade Corridor is currently functioning at LOS D, considered to be near capacity.

Projected growth in operations along the Tehachapi Trade Corridor will compound existing inefficiencies, which will lead to a reduction of available time for track maintenance and recovery from incidents such as mechanical failure. By 2015, the Tehachapi Trade Corridor is projected to have an average of 40 trains per day; the equivalent of LOS E (0.80). At volume-to-capacity ratios significantly greater than LOS E, train flow rates and schedule reliability deteriorate and more time is needed to recover from disruptions. To provide acceptable and competitive service to shippers and receivers, railroads typically aim to operate rail corridors at LOS C/D or better. The project seeks to increase the maximum daily capacity through the Tehachapi Trade Corridor to achieve the desired LOS. The expected yearly growth in the average daily trains would contribute to more bottlenecks and reduced operational efficiency.

As shown in Table 1.1-2, the current capacity of the tracks through the Tehachapi Pass is limited to a maximum peak volume of 50 trains per day. Improving each single-track segment provides added track capacity for daily operations. Therefore, as each segment of railroad is double tracked, the maximum capacity of the railroad corridor increases accordingly.

However the corridor is unable to sustain running the maximum peak volume of trains for more than a few days without requiring maintenance. The analysis in this environmental document is based on 35 trains per day which is the average daily number of trains that pass through the project segments.

Table 1.1-2 Track Capacity by Segment

Segment	Capacity Improvement By Segment (Trains)	Pre-Construction Maximum Capacity (Trains)	Post-Construction Maximum Capacity	Projected Train Lengths at Track Capacity (Post Construction)		Maximum Container Equivalent Units*
				8,000-ft. Trains	6,000-ft. Trains	
Walong to Marcel only	4	50	54	6	48	12,480
Cliff Siding only	2	50	52	6	46	12,030
Both Segments Built	6	50	56	12	44	13,260

Source: BNSF, 2012

* 6,000-foot trains have 225 truck containers per train; 8,000-foot trains have 280 truck containers per train.

Adding more track within a single-track segment would allow additional freight movement (containers and manifest cars). With single-track segments, trains must pull into sidings to allow oncoming trains to pass to avoid collisions. The length of the trains allowed through the segments is limited by the length of sidings. Double-tracking two of nine single-track

segments would allow for an increased number of longer 8,000-foot trains through the Tehachapi Trade Corridor. Additional length of trains would allow an average increase of 550[1] containers per day through the Tehachapi Pass by 2015. Also, train starts and stops on sidings and existing single-track segments through the steep mountain terrain, which limits capacity of the Tehachapi Trade Corridor, would be reduced with the addition of double-track segments, which would result in more efficient operations.

Anticipated Freight Demand Increase

The Tehachapi Trade Corridor is experiencing increased volume, congestion, and delays. Rail volumes through the Tehachapi Pass have greatly increased in the past decade due to growth in the volume of goods transported through the region. The remaining operational capacity of the rail line, defined as the available train slots, is expected to soon reach zero. As shown in Table 1.1-3, the total average number of containers per day that are transported through the Tehachapi Trade Corridor by both truck and train is 16,714.

Table 1.1-3 Existing Average Daily Freight Volumes, Tehachapi Pass

Existing Conditions		
	Existing Average (Demand)	**Existing Peak (Demand)**
Trains		
6,000-foot trains[1]	33	48
8,000-foot trains[2]	2	2
Total Number of Trains	35	50
Container Equivalent Units		
Containers from 6,000-foot trains	7,425	10,800
Containers from 8,000-foot trains	560	560
Total Containers Equivalent Units[3]	7,985	11,360
Trucks[4] on State Route 58	8,729 trucks[5]	
Total Containers and Trucks	16,714	20,089

Source: BNSF, 2012

1. A 6,000-foot train has 4 locomotives and 225 containers per train.
2. An 8,000-foot train has 5 locomotives and 280 containers per train.
3. Trucks account for 30% of trips on State Route 58, 90% of which is to and from Northern California (26% is international trade).
4. Truck volumes from Kern COG 2006 traffic model network have been grown at a rate of 2% per year.
5. Each container is the equivalent of one truck.

[1]Current track configuration allows for up to two 8,000-foot trains per day with all remaining trains limited to 6,000 feet. By 2015, this fleet mix would be equal to 9,110 containers per day on average. Once the project is completed, up to 12 8,000-foot trains could be supported by the railroad tracks. This would equal 9,660 containers per day on average, an increase of 550 containers as a result of using longer trains.

The train count is currently 35 trains per day, representing the current daily average number of trains through the Tehachapi Pass. These 35 trains carry an average of 7,985 containers each day (1 container = 1 truck). Train counts are based on 11 years of daily train operations, from January 2000 to December 2010, including both pre-recession and recession conditions. The 35-train daily average is based on actual train counts from BNSF and Union Pacific Railroad (UPRR) from 2000 to 2010. Operations after a line stoppage or other isolated conditions could range from a minimum of 22 trains to a maximum of 50 trains. Peaks above the existing 35-train daily average are intermittent due to temporary activities such as track inspection, right-of-way maintenance, and track replacement. Historical train counts show that there were eight days when the number of trains reached 50 per day in the 11-year analysis period. Because these were isolated incidents, the peaks are uncharacteristic and are not used as the baseline for environmental analysis.

Based on BNSF business projections (S. Stewart, 2012), freight volumes through the Tehachapi Trade Corridor are estimated to increase, affecting average daily train volume. BNSF estimates this growth in freight volume based on its year-to-year market growth projections. Freight volumes moving by rail will increase by nearly 14 percent from an existing average of 7,985 containers per day to 9,110 containers per day by 2015. It is estimated that in 2013, train volume is projected by BNSF to be an average of 37 trains with intermittent demands of up to 51 trains per day as shown in Table 1.1-4. With a current maximum capacity of 50 trains per day, average demand and its peaks exceed acceptable operating LOS. Furthermore, the tracks are unable to sustain running at capacity for more than a few days without maintenance. So, the current railroad conditions and configuration will not be able to accommodate projected average container throughput. Once the rail corridor is operating at increased container volumes, all additional freight movement would have to be transported by truck, adding traffic to the state's highways, including State Route 58. Therefore, on a peak day in 2013, when track capacity is met, as many as 280 additional trucks would travel through the pass on State Route 58 to handle that demand.

Increases in train volumes through the Tehachapi Trade Corridor will occur regardless of whether the project is built. BNSF business projections project that by 2015, traffic on the existing rail line is projected to increase to reach an average of 40 per day (9,660 containers) with an intermittent peak demand of 54 trains per day (13,260 containers) (Table 1.1-4). While projections of future isolated conditions with peak demands of 54 trains per day are uncommon, in 2015 (project completion year), peak train demand will not be able to be accommodated with the existing railroad configuration. Any additional freight would need to be transported by truck thereby adding to existing traffic on adjacent roadways. More than 1,000 containers would need to be transported by truck along State Route 58 on days with

peak demands[2]. Therefore, any additional freight that cannot be accommodated by rail would need to be transported by truck. Construction of the project would allow peak freight demand to be handled by train, avoiding the air quality impacts of adding more than 1,000 trucks to the projected truck volume of 8,729 on State Route 58 on a peak day.

Table 1.1-4 Train Volume Projections (Demand)

	2012 (Existing)	2013	2014	2015 (Build-out)	2015 Freight Demand (Containers)
Minimum	22	24	25	27	6,735
Average	35	37	38	40	9,660
Peak	50	51	52	54	13,260

Note: In 2013, peak train volume demand will be 51, which will exceed railroad capacity. All freight in excess of the 50-train capacity will have to be transported by truck on a peak day.
Source: BNSF, 2011

1.2 Alternatives

Three alternatives are being considered: the Build Alternative, the Reduced-Segment Alternative and the No-Build Alternative. The alternatives are evaluated in this document based on their ability to meet the project's purpose and need and minimize the project's environmental effects. The capacity-related details of the Build Alternative and the Reduced Segment Alternative are shown in Table 1.2-3.

The project alternatives were developed by an interdisciplinary team that included representatives from BNSF, Union Pacific Railroad, Caltrans Division of Rail and Caltrans District 6.

1.2.1 Build Alternative

The Build Alternative would double-track two segments within the project area (see Figure 1.1-1) and extend culverts. The project would build a new second main track next to and parallel to the existing single track at most locations. Most of the project would be built on existing cleared or disturbed areas and maintenance roads within the UPRR right-of-way.

A new access road would be built next to the new track for maintenance access and to protect the track against rockfall and erosion. Existing maintenance roads would remain in locations where construction does not affect them, be reestablished next to the new track in affected locations, where possible, or be eliminated where significant topography or environmental

[2] Represents a worst-case scenario. A peak 2015 condition is projected at 54 trains. The freight of 50 trains would be accommodated by rail movement. The freight of the additional 4 trains (up to two 8,000-foot trains [280 containers each] and two 6,000-foot trains [225 containers each]) would need to be transported by trucks along adjacent roadways.

concerns limit the construction area. All existing culverts would be extended and equipped with appropriate velocity dissipation features as determined by the multi-disciplinary team during the project's design phase.

The project would be built according to the rail segment priority order. The order was determined by various engineering and topographical factors. Locations were chosen to minimize or avoid impacts to watercourses, culverts, tunnels, and historical fills. Project construction would start in 2013 and be completed in 2015 (see Table 1.2-1).

Table 1.2-1 Segment Construction Order of Priority and Schedule

Segment	Priority of Construction	Start Date (year)	Completion Date (year)
Walong to Marcel	1	2013	2014
Cliff Siding	2	2015	2015

Source: BNSF 2011

As shown in Table 1.2-1, construction would adhere to the following order and schedule:

Priority #1: Walong to Marcel (mile posts 352.07 to 353.08). The proposed double-track alignment is 1.01 miles long and would parallel the existing track north, connecting the Walong siding with the Marcel siding. The new track, proposed to be built in a graded slot about 40 to 50 feet north of the existing track centerline, would bypass Tunnel 10. Four culverts in this segment would be extended.

Priority #2: Cliff Siding Extension (mile posts 343.27 to 343.64). The Cliff Siding segment is the shortest segment to be double-tracked, totaling only 0.37 mile. The double-track extension of the existing siding would occur on track south. The segment would require one private crossing. Tunnel 7 would not be part of the project. Three culverts in this segment would be extended

The project would cut slopes and extend existing culverts. Double-tracking the project segments would require grading, with cut and fill earthwork. The amount of cuts and fills would vary depending on the steepness and constraints imposed by the topography. The approximate amount of earthwork involved during construction of the two segments would be as follows: 359,623 bank cubic yards would be cut and 106,579 bank cubic yards would be filled, with a surplus of 253,044 bank cubic yards resulting from construction of the proposed project. The project design would minimize the amount of cut and fill to reduce the need for additional right-of-way and to reduce biological and cultural impacts outside of the right-of-way.

Six staging areas have been identified and are shown in Appendix D of the Traffic Impact Assessment prepared for the project. Staging areas would be used to temporarily stockpile construction fill material and serve as lay down areas for construction vehicles and supplies. The staging areas are sited at previously disturbed areas and may extend beyond the existing UPRR right-of-way.

Up to three crews could work on the project, using various types of construction equipment, including excavators, dozers, compactors, water trucks, cranes, and graders. As referenced within Kern County Code, Title 8, construction operations would not occur between 9:00 p.m. and 6:00 a.m. Monday through Friday or at any time between 9:00 p.m. and 8:00 a.m. during weekends and holidays. Construction would not occur at nighttime, so that potential light and glare on residences, roads, and public use areas would be avoided.

1.2.2 Reduced-Segment Alternative

This alternative would double-track one of the nine segments in the 28.11 mile corridor from Bena to Cable. The Reduced-Segment Alternative project would build out Walong to Marcel (mile posts 352.07 to 353.08). The proposed double-track segment is 1.01 miles long and would parallel the existing track to the north, connecting the Walong siding with the Marcel siding. The new track, built in a graded slot about 40 to 50 feet north of the existing track centerline, would bypass Tunnel 10. Four culverts require change in this segment. Construction would be as described above for the two-segment alternative.

1.2.3 No-Build Alternative

Under the No-Build Alternative, no planned improvements would be made for the existing tracks. No new second main track through Tehachapi Pass would be built, and railroad operations in the region would continue as they are now. The No-Build Alternative would allow continuation of existing rail services as defined under the BNSF and Union Pacific Railroad operation plan.

Future peak demand is projected at 54 trains per day; track capacity would remain at 50 trains sustained per day. With a current maximum existing capacity of 50 trains per day, average demand and its peaks exceed acceptable operating LOS. Therefore, the freight that would be carried on the projected additional four trains would have to be transported by truck on State roadways. By 2015, on a peak day, more than 1,000 additional trucks would be needed to meet the freight demand that would otherwise be accommodated by the Tehachapi Trade Corridor.

The No-Build Alternative would not meet the project purpose and need. Delays would increase for trains going through the Tehachapi Pass due to the expected future growth in freight traffic volumes, and the stops and delays required for these trains to navigate the existing single-track segments. These inefficiencies in rail operation would adversely affect trains that use the tracks, drop the LOS to E or F, and have the potential to foster a freight modal shift from rail to a far less environmentally desirable option—truck transport. As train delays increase, transportation by truck, as the quicker and more efficient method, would be the option selected to move goods through the Tehachapi Pass.

1.2.4 Comparison of Alternatives

This environmental impact report has offered three alternatives for consideration: the Build Alternative, the Reduced-Segment Alternative, and the No-Build Alternative.

Both build alternatives would meet the basic objectives of the project, but the Reduced-Segment Alternative would meet these objectives to a lesser extent. Improving each of segments would incrementally reduce congestion and improve rail efficiency. However, since the overall number of trains is expected to increase, if left in a single-track condition, the Cliff Siding Extension segment would experience bottleneck conditions and train idling more frequently.

The Reduced-Segment Alternative would also result in more truck traffic on State Route 58. While the Reduced-Segment Alternative would help relieve congestion and support an increased train volume, which would relieve long-haul truck traffic from State Route 58, rail LOS would still be a level F on a peak day, and additional trucks would be needed to transport freight in excess of what could be accommodated by rail. With the Build Alternative, track capacity would be sufficient to handle peak rail volumes once the project is completed and result in a more beneficial impact to air quality and traffic.

In some impact areas, the Reduced-Segment Alternative would result in slightly reduced impacts compared to the Build Alternative. But, neither the Build Alternative nor the Reduced-Segment Alternative would result in any substantial environmental impact. Construction and operational impacts for each of the three alternatives are discussed in greater detail in Chapter 2.

Completion of the Build Alternative would accommodate an average freight volume of 9,660 containers per day due to the greater number of 8,000-foot trains that can be supported by the expanded rail line.

Table 1.1-2 shows the comparison of build alternatives, and Table 1.2-3 shows the comparison of projected freight demand by alternative, including the No-Build Alternative. Table 1.2-4 reports potential impacts of all three alternatives for all resource categories.

Based on the analysis and results of technical studies prepared for the project, Caltrans has determined that the Build Alternative is the environmentally superior alternative. No decision on the project will be made until the general public, interested parties and governmental agencies have an opportunity to provide input on this draft environmental impact report and the project.

After the public circulation period, all comments will be considered, and Caltrans will select a preferred alternative and make the final determination of the project's effect on the environment. In accordance with the California Environmental Quality Act (CEQA), Caltrans will certify that the project complies with the California Environmental Quality Act, prepare findings for all significant impacts identified, prepare a Statement of Overriding Considerations for impacts that will not be mitigated below a level of significance, and certify that the findings and Statement of Overriding Considerations have been considered prior to project approval. Caltrans will then file a Notice of Determination with the State Clearinghouse that will identify whether the project will have significant impacts, if mitigation measures were included as conditions of project approval, that findings were made, and that a Statement of Overriding Considerations was adopted.

Table 1.2-2 Comparison of Build Alternatives

	1-Segment Project [1.]	2-Segment Project
Average Train Volume	40	40
Peak Train Volume	54	54
Increase in Track Capacity	4	6
Railroad Capacity	54	56
2015 Average Daily LOS (Rail)	D (0.74) Near/At Capacity	D (0.71) Near Capacity
2015 Peak Daily LOS (Rail)	F (1.00) Above Capacity	E (0.96) At Capacity
Amount of 8k trains per day	Up to 6	Up to 12

1. The Reduced Segment Alternative (1-Segment Alternative) is based on constructing the Walong to Marcel segment only.

Table 1.2-3 Projected Freight Demand

	No-Build Alternative		Reduced-Segment Alternative			Build Alternative		
	Average Demand	Peak Demand[1].	Average Demand	Peak Demand	Track Capacity	Average Demand	Peak Demand	Track Capacity
Trains	**(No-Build)**	**(No-Build)**				**(Build)**	**(Build)**	**(Build)**
6,000-foot trains [2]	38 train	48 trains	34 trains	48 trains	48 trains	28 trains	42 trains	44 trains
8,000-foot trains [3].	2 trains	2 trains	6 trains	6 trains	6 trains	12 trains	12 trains	12 trains
Total Number of Trains	40 trains	50 trains[4]	40 trains	54 trains	54 trains	40 trains	54 trains	56 trains
Trucks needed for excess freight[1].	-	1,010[5]	-	-	-	-	-	-
	Container Equivalent Units							
Containers from 6,000-foot trains	8,550	10,800	7,650	10,800	10,800	6,300	9,450	9,900
Containers from 8,000-foot trains	560	560	1,680	1,680	1,680	3,360	3,360	3,360
Total Containers Equivalent Units	9,110	11,360	9,330	12,480	12,480	9,660	12,810	13,260
SR-58 Average Truck Volume	8,729	8,729	8,729	8,729	8,729	8,729	8,729	8,729
Total Demand for Freight	18,322	21,582	18,542	21,692	21,692	18,872	22,022	22,472

[1]. Note: Future without-project peak demand conditions cannot be accommodated by existing track configuration. Therefore freight that would be transported on a future without-project peak day in excess of the 50-train capacity would have to be transported by truck.

[2]. A 6,000-foot train has 4 locomotives and 225 containers per train.

[3]. An 8,000-foot train has 5 locomotives and 280 containers per train.

[4]. Capped at 50 trains per day due to track capacity constraint. (Demand with additional capacity would be 54 trains.)

[5]. When trains' demand peaks over track capacity, approximately 1,010 additional trucks would pass through the Tehachapi Trade Corridor on SR 58.

[6]. With construction of the 2-segment project, approximately 550 additional containers per day can be transported by rail as opposed to by trucks.

[7]. When train demand peaks, total trucks and containers are 22,472.

Source: BNSF, 2012

Table 1.2-4 Summary of Potential Environmental Impacts from Alternatives

Potential Impact	Build Alternative	Reduced-Segment Alternative	No-Build Alternative
Human Environment			
Land Use	Permanent: 0.70 acre of land acquisition Temporary: 5.33 acres of land acquisition	Permanent: 0.66 acre of land acquisition Temporary: 2.09 acres of land acquisition	No impact to land use would occur.
Farmlands	Permanent: 0.66 acre of farmland. Temporary: 2.46 acres of farmland.	Same impacts as Build Alternative.	No impact to farmland would occur. Farmland would stay as grazing land.
Public and Emergency Services	Potential minor temporary impacts to emergency access. Delays from gate-down times could be up to 53 seconds.	Potential minor temporary impacts to emergency access. Delays from gate-down time could be up to 29 seconds	No impact anticipated. Train operations would continue as they do now; no additional public or emergency services would be required. Increased gate-down times will occur as rail demand increases.
Traffic and Transportation	Longer trains will result in increased gate-down times. However, these impacts are relatively minor. Reduction in traffic may also occur on other roads due to increased freight capacity in the Tehachapi Trade Corridor. As a result of increased rail capacity, up to 1,125 trucks could be removed from State Route 58.	Same impacts as compared to Build Alternative; 330 fewer trucks have the potential to be removed from State Route 58.	Rail traffic on the Tehachapi line would be considered “at capacity” on an average freight movement day, and “above capacity” on peak freight movement days. All freight that would need to be transported in excess of the actual rail capacity would have to be transported by truck along and exacerbate projected traffic volumes along State Route 58.
Visual and Aesthetics	Minor impacts to oak woodlands scenic resources would occur along the Walong to Marcel segment. Most locations are remote from viewers. Removed oak trees will be replaced consistent with applicable regulations.	Same impacts as Build Alternative.	No impact anticipated. Train operations would continue as they do now; no new visual or aesthetic impacts would occur.
Cultural Resources	There are no anticipated impacts to sites due to avoidance measures.	Same impacts as Build Alternative.	No new area would be disturbed; therefore, no impacts to areas containing potential cultural resources would occur.
Physical Environment			
Hydrology and Floodplain	There would be a negligible change in pre- and post-construction storm flows. Seven culverts would be changed to accommodate the increased right-of-way.	Similar impacts as Build Alternative. Four culverts would be modified to accommodate the increased right-of-way.	No impacts to hydrology or floodplain. Conditions would remain the same.

Potential Impact	Build Alternative	Reduced-Segment Alternative	No-Build Alternative
Water Quality	Dust created during construction could pose potential impacts to water bodies; however, such impacts would be minimal with implementation of best management practices.	Same impacts as Build Alternative.	No impact anticipated. No new area would be disturbed; existing conditions would remain unchanged. No impacts to water quality would occur.
Geology/Soils/ Seismic/Topography	Minimal impacts with implementation of minimization measures.	Same impacts as Build Alternative.	No impacts to geology, soil, or topography are anticipated. All seismic issues would remain unchanged.
Paleontology	There are no known resources impacts. Monitoring measures would be included to protect unknown resources.	Same impacts as Build Alternative.	No impact anticipated. The train would continue to run in an existing, already-disturbed rail corridor. No additional adverse impacts are anticipated.
Hazardous Waste or Materials	Compliance with OSHA requirements and elements of the blasting plan would minimize impacts during construction.	Same impacts as Build Alternative.	No impact anticipated. Current train operations would continue; no exposure to new hazardous waste or materials sources would occur.
Air Quality	The Build alternative would result in a beneficial impact to air quality from expanded use of less polluting trains compared to trucks, reduction of delays on the existing track, reduction of traffic congestion on roadways by foregoing cargo transport by trucks, and a reduction in roadway maintenance activities.	The Reduced-Segment Alternative would result in less of a beneficial impact than the Build Alternative to air quality due to fewer trains enabled by this alternative.	The No-Build Alternative would result in the most emissions of the analyzed alternatives when the existing Tehachapi Trade Corridor tracks reach capacity. Higher air pollutant emissions from this alternative are associated with cargo movement by more polluting trucks, increased volume of trucks and a greater need for roadway maintenance/construction.
Noise and Vibration	Receptors would see a 0.1- to 1.0-dBA increase in ambient level noise.	Noise impacts would be less compared to Build Alternative.	Noise conditions would remain the same.
Biological Resources Environment			
Natural Communities	The project would result in a small and limited impact to natural communities as a result of construction and operation of the new track. Temporary impact: 6.3 acres. Permanent Impact: 10.01 acres. A Native Vegetation Restoration and Monitoring Plan would be implemented. Impacts would occur to oak trees;	Similar impacts as Build Alternative.	No impact anticipated. Train operations would remain as they are now, and no impacts to natural communities would occur.

Potential Impact	Build Alternative	Reduced-Segment Alternative	No-Build Alternative
	replanting at a 3-acre to 1-acre ratio.		
Wetlands	The project would not temporarily or permanently affect jurisdictional or non-jurisdictional wetlands.	Same impacts as Build Alternative.	No impact anticipated. Train operations would remain as they are now, and no impacts to wetland areas would occur.
Plant Species	The project would result in a small and limited impact to local tree, shrub, plant, and other native tree species in the biological study area. No special-status, threatened, or endangered species would be affected.	Impacts are similar to the Build Alternative. No special-status, threatened, or endangered species would be affected.	No impact anticipated. Train operations would remain as they are now, and no impacts to plant species would occur.

Alternatives Considered but Eliminated from Further Discussion

The following alternatives were considered but eliminated due to design constraints and significant environmental impacts:

Double-tracking the 28.11 miles from Bena to Cable: This alternative would double-track all nine single-track segments between Bena and Cable, which includes the two project segments and seven additional segments. These seven additional segments would require cuts into steeply graded mountains and expansion to the numerous bridges crossing Tehachapi Creek; this would pose significant engineering and design challenges due to existing topographical and design constraints. While this alternative meets the project objectives, it was considered infeasible.

Double-tracking five single-track segments in the 25.23-mile corridor from Bena to Marcel: This alternative would include the two segments identified for double-tracking by the project and three additional segments totaling 8.57 miles of project-related double-tracking. The following additional segments would be constructed:

- 2.69 miles from Bena to Ilmon
- 2.75 miles from Caliente to Bealville
- 1.75 miles from Rowen to Woodford

As a result of double-tracking the five segments, all trains through the Tehachapi Trade Corridor could be 8,000 feet long. However, inclusion of these segments would result in additional potentially adverse impacts to resources such as Waters of the United States, wildlife habitat, and the recently designated Cesar Chavez National Monument. Evaluation and mitigation of these impacts, along with any permitting that could be required to address them, could necessitate additional analysis and result in infeasible project delays. This alternative would result in potentially greater environmental impacts than would occur under the proposed project. So, while this alternative would otherwise meet the project objectives, it was eliminated from consideration due to these factors.

1.3 Permits and Approvals Needed

The following permits, reviews, and approvals would be required for project construction:

Table 1.3-1 Permits and Approvals Needed

Agency	Permit/Approval	Status
San Joaquin Valley Air Pollution Control District	Asbestos and Disposal Permit	To be obtained before project grading
Caltrans and County of Kern Public Works Department	Stormwater Pollution Prevention Plan	To be obtained before project grading
County of Kern Roads Department	Construction-related Road Closure Permit	To be obtained during project construction, 5 working days before need for road closure/detour
California Public Utilities Commission	Grade-crossing Permit (GO-88B)	To be obtained before start of construction for each project segment
Caltrans	Extra-legal Permit	To be obtained before start of construction

Chapter 2 Affected Environment, Environmental Consequences, and Avoidance, Minimization, and/or Mitigation Measures

This chapter explains the impacts that the BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement project would have on the human, physical, and biological environments in the project area. It describes the existing environment that the project could affect, potential impacts from each alternative, and proposed avoidance, minimization, and/or mitigation measures. Any indirect impacts are included in the general impacts analysis and discussions that follow. Technical studies have been prepared to support the general impact analyses and are listed in Appendix D of this document; the technical reports are provided in their entirety as separate documents.

Please note that the analysis in this chapter uses an environmental baseline for the average number of trains that go through the Tehachapi Pass each day. The environmental baseline at the time of the Notice of Preparation (the public notice that stated that an Environmental Impact Report would be prepared) is 35 trains per day, which represents the current daily average number of trains that pass through the Tehachapi project segments. These 35 trains carry about 7,985 containers each day. The baseline train counts are based on 11 years of daily train operations (January 2000 to December 2010), including both pre-recession and recession conditions. Since operational conditions vary from year to year based on economic cycles, the baseline reflects the actual cycles and conditions. The 35-train daily average is based on train counts from BNSF and Union Pacific Railroad. The standard deviation is five trains. This means that the range of trains that typically go through the Tehachapi Pass is 30 to 40 trains per day.

Due to seasonal fluctuations, train movements after track stoppages and other isolated events could increase from 35 trains per day up to 50 trains. Peaks above the existing 35-train daily average are intermittent and temporary because of factors such as track inspection, right-of-way maintenance, and track replacement. The train counts show, for example, that there were only eight days when trains reached 50 per day in the 10-year analysis period. Because these are isolated incidents, the peaks are atypical and are not used as the baseline for purposes of the environmental analysis. Similarly, the future-year average is used in the environmental impact analysis in this chapter.

As part of the scoping and environmental analysis done for the project, the following

environmental issues were considered. It was determined that the project would result in no impacts to these environmental topics. Consequently, there is no further discussion of these issues in this document:

- Coastal Zone – The project is not in a coastal zone (U.S. Geological Survey map, field visit May 2008).
- Wild and Scenic Rivers – There are no wild or scenic rivers within the project boundary (Preliminary Jurisdictional Report, URS 2013).
- Parks and Recreation – There are no public parks or recreational areas near or next to the project (Kern County General Plan, 2009).
- Timberlands – The project area is not in a timberland-zoned area, or forest resource area (as defined by California Government Code Section 51104 (g)). The project area does not contain any timberland resources (Kern County General Plan, 2009).
- Energy – No impacts are expected with respect to energy because the project will result in increased use of trains instead of trucks to transport freight. Trains require significantly less energy than trucks to transport freight and as such, there will be a net reduction in energy consumption as a result of the project.

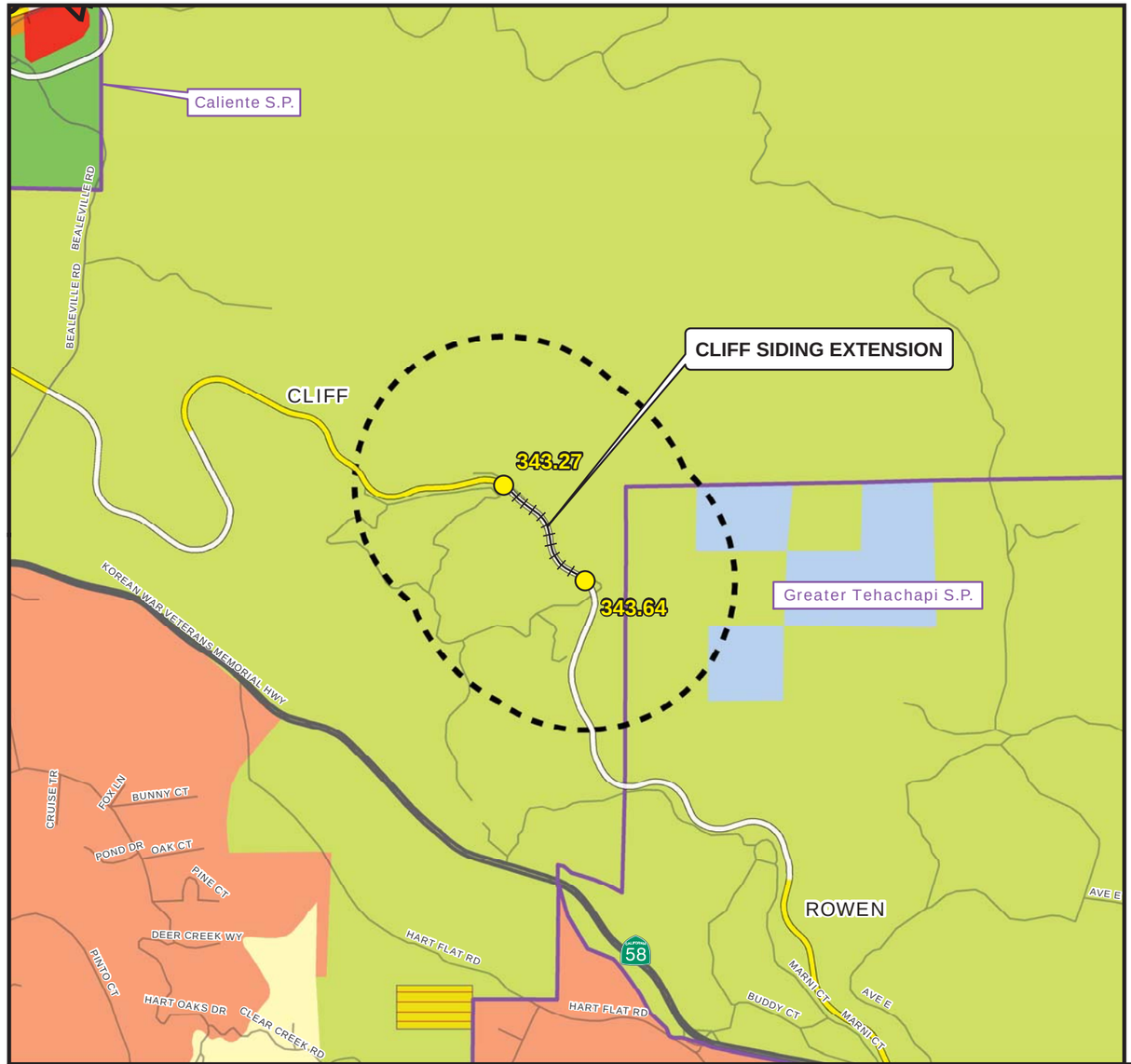
Mitigation measures are proposed to offset and alleviate potentially significant project impacts to a level that is within the California Environmental Quality Act threshold of significance. Even in cases where impacts are not significant, it is Caltrans' policy to minimize all impacts to the extent that is feasible. These measures are identified as "minimization measures" and are implemented even where no mitigation measures are otherwise required. Minimization measures are incorporated in the planning and design stages of a project to reduce impacts.

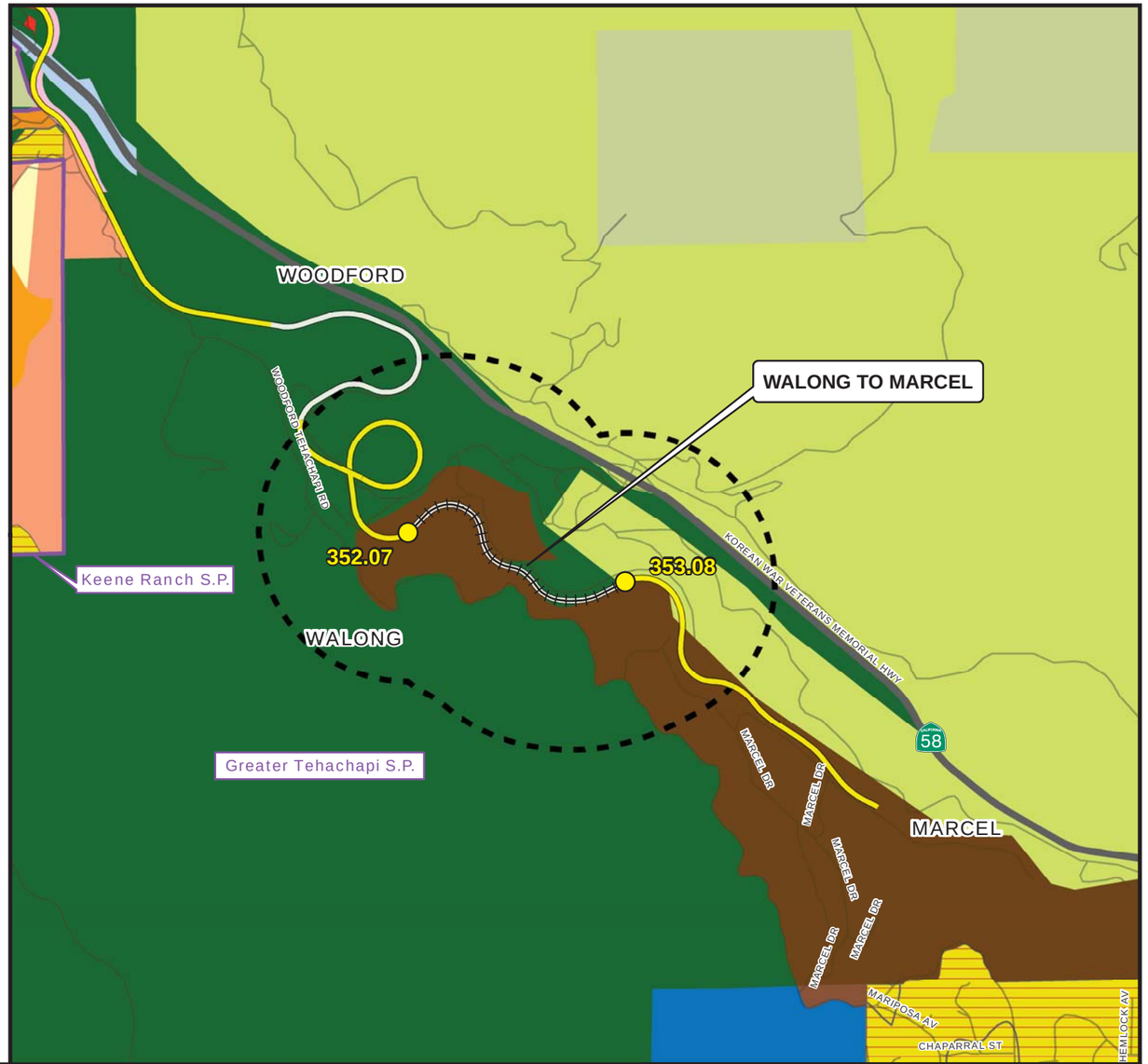
2.1 Human Environment

2.1.1 Land Use and Planning

Existing and Future Land Use

The project lies in an unincorporated area of Kern County, within the Tehachapi Mountain Ranges. The two project segments are not next to any established communities. Except for a minor portion of County-owned land east of the Cliff Siding Extension, lands within a half-mile of the project segments are privately owned and subject to the Kern County General Plan, the Greater Tehachapi Area Specific Plan, and the Kern County Zoning Ordinance. Figure 2.1-1 shows the General Plan land use designations within a half-mile of the project area. Figure 2.1-2 shows the zoning designations within a half-mile of the project area.





Sources: Kern County Aeessor General Plan, 2011. / JL Patterson & Associates

Legend

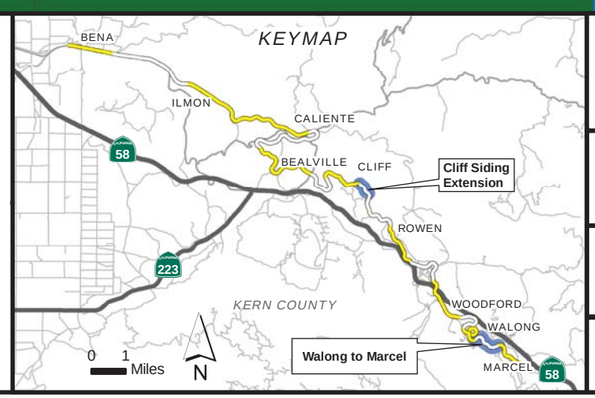
BNSF TEHACHAPI

- Segment Milepost
- Project Segments
- Existing Single Track Not in Project
- Existing Double Track Not in Project
- Highway
- Road
- Half Mile Radii of Study Area

Kern County General Plan 2011

- Educational Facilities
- Extensive Agriculture (Min. 20 Acre Parcel Size)
- General Commercial
- Intensive Agriculture (Min. 20 Acre Parcel Size)
- Maximum 10 Units/Net Acre
- Maximum 7 Units/Net Acre
- Maximum 2 Units/Net Acre
- Maximum 1 Unit/Net Acre
- Minimum 20 Gross Acres/Unit
- Minimum 10 Gross Acres/Unit
- Minimum 5 Gross Acres/Unit
- Minimum 2.5 Gross Acres/Unit
- Minimum 2.5 Gross Acres/Unit - Cluster Option
- Minimum 2.5 Gross Acres/Unit - Cluster Requirement
- Other Facilities
- Public or Private Recreation Areas
- Resource Agriculture (Min. 20 Acre Parcel Size)
- Resource Management (Min. 20 Acre Parcel Size)
- Resource Reserve (Min. 20 Acre Parcel Size)
- State or Federal Land
- Specific Plan Area Boundary (SP)

0 0.5 1 Miles



BNSF/UPFF Mojave Subdivision Tehachapi Rail Improvement Project

General Plan and Specific Plan Land Use

March 2013

Figure 2.1-1

Caltrans

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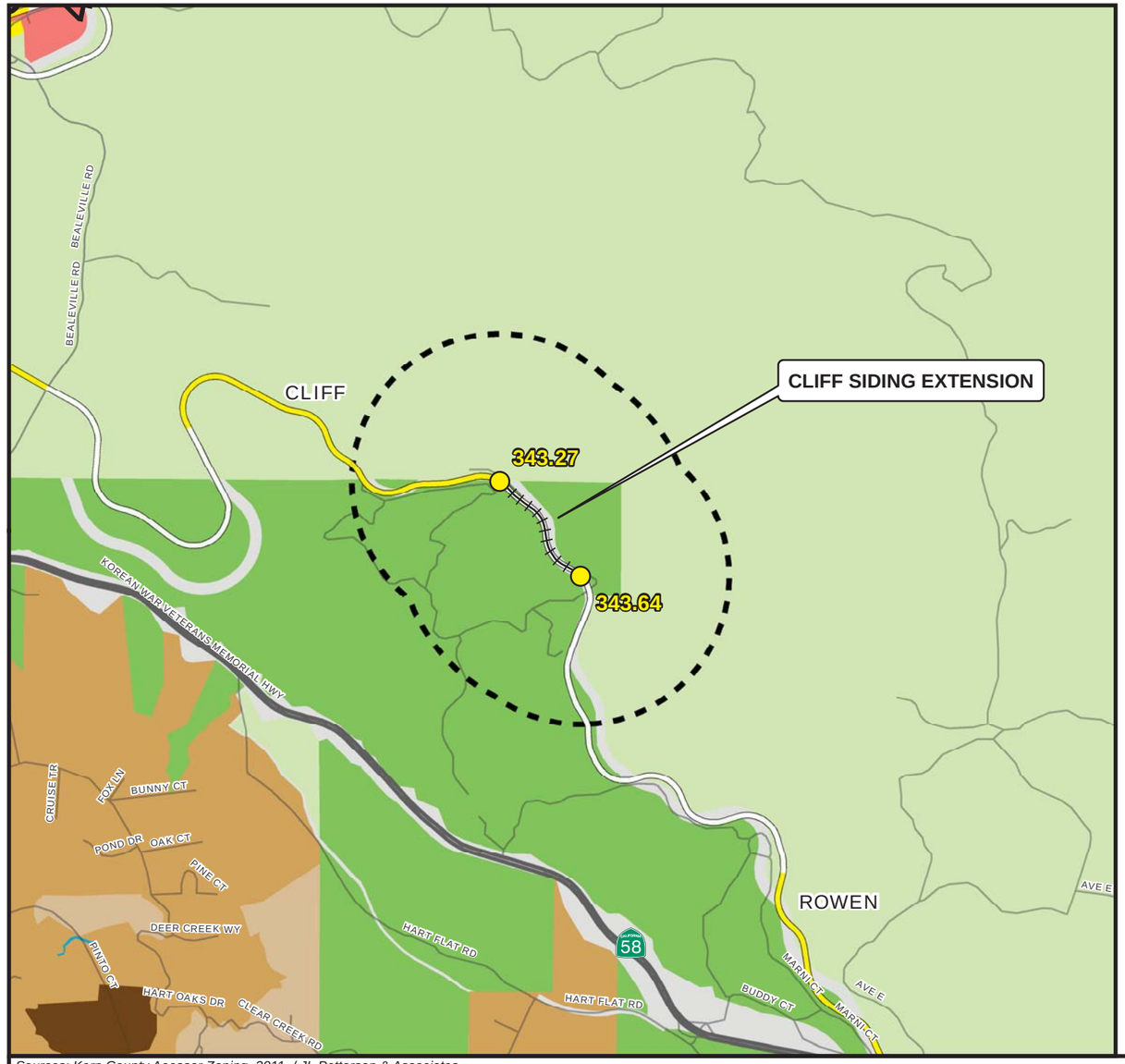
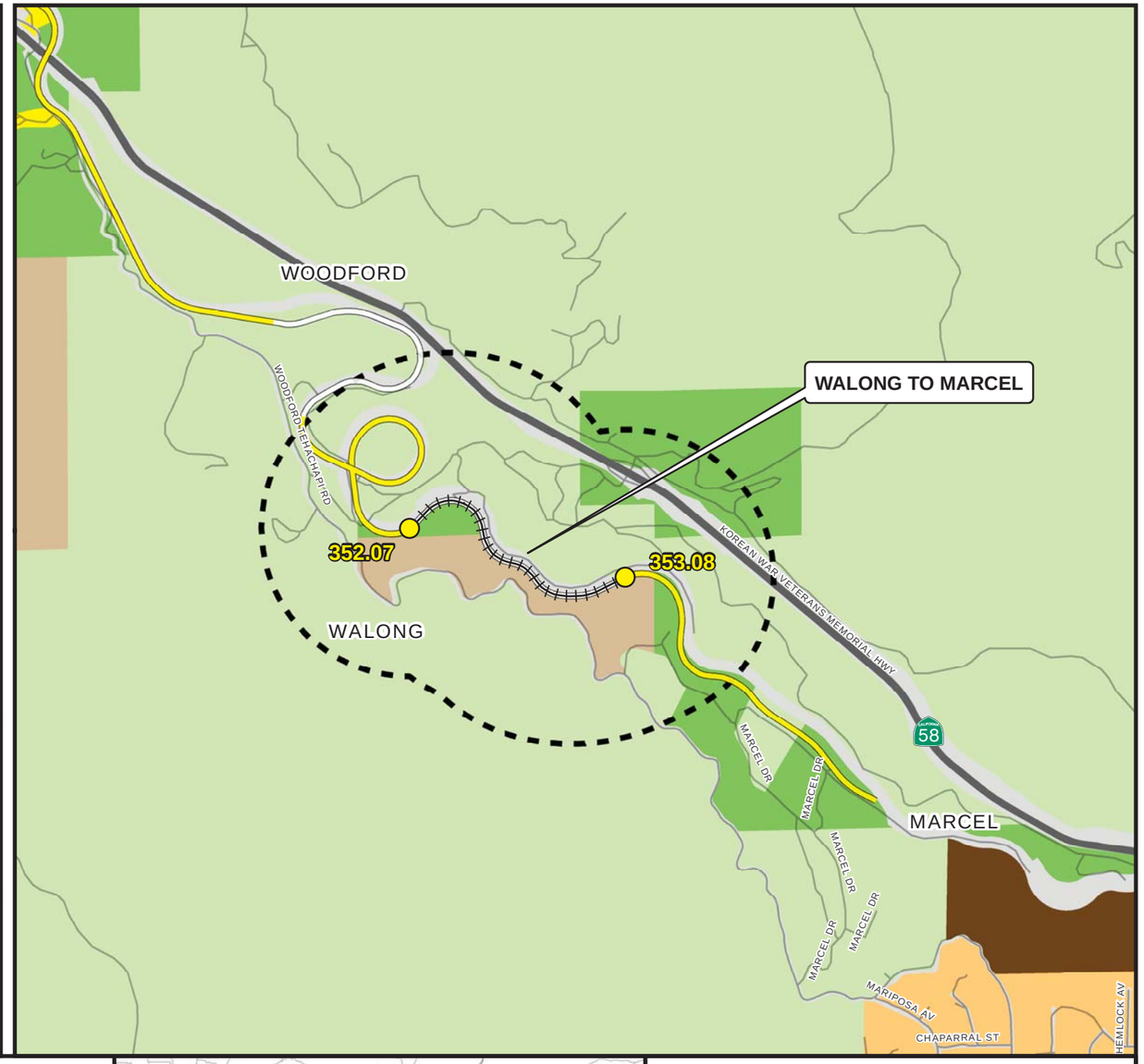




Sources: Kern County Aeessor Zoning, 2011. / JL Patterson & Associates

Legend

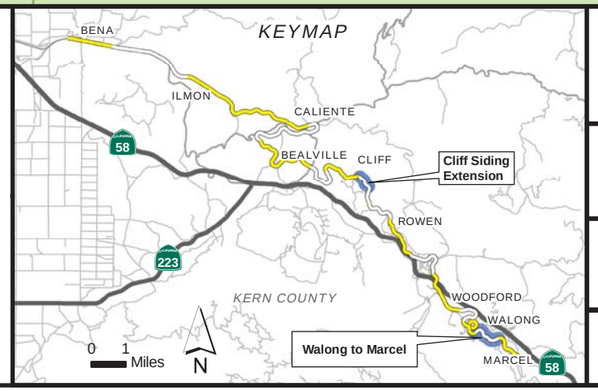
BNSF TEHACHAPI

- Segment Milepost
- Project Segments
- Existing Single Track Not in Project
- Existing Double Track Not in Project
- Highway
- Road
- Half Mile Radii of Study Area

Kern County Zoning 2011

- Exclusive Agriculture (A)
- Limited Agriculture (A-1)
- Neighborhood Commercial (C-1)
- Estate 1 Acres (E [1])
- Estate 1 1/2 Acres (E [2 1/2])
- Floodplain Primary (FPP)
- Low Density Residential (R-1)
- Estate 5 Acres (E [5])
- Estate 20 Acres (E [20])

0 0.5 1 Miles



BNSF/UPFF Mojave Subdivision Tehachapi Rail Improvement Project

Zoning

March 2013

Figure 2.1-2

I:\BNSF_Tehachapi_Rail_Alignment\MXDs\2013\BNSF-UPRR_Tehachapi_Pass_Fig1-1-3_27Feb2013.mxd

The General Plan land use designations include Resource Reserve (Map Code 8.2), Extensive Agriculture (Map Code 8.3), and Residential 20+ Gross Acres/Dwelling Unit Maximum (Map Code 5.8).

The Resource Reserve designation covers defined areas of mixed natural resource characteristics—such as rangeland, woodland, and wildlife habitat—that occur in an established county water district. The Extensive Agriculture designation is intended for agricultural uses involving large amounts of land with relatively low value-per-acre yields, such as livestock grazing, dry land farming, and woodlands. The minimum parcel size for the Resource Reserve and Extensive Agriculture designations is 20 gross acres, except lands subject to a Williamson Act or Farmland Security Zone contract (see Section 2.1.3, *Farmlands*), which would require a minimum parcel size of 80 gross acres. Lands designated Residential 20+ Gross Acres/Dwelling Unit Maximum are located in the outlying, less densely settled areas that do not require connections to public water and sewer infrastructure and are often characterized by physical constraints.

Zoning designations within a half-mile of the project area, shown in Figure 2.1-2, include Exclusive Agriculture (A), Limited Agriculture (A-1), and Residential Suburban (RS) Combining District with Estate 1 Acre (E[1]). The Exclusive Agriculture and Limited Agriculture zoning districts allow for various agricultural uses including cattle and livestock grazing. The Residential Suburban Combining District with Estate 1 Acre allows accessory agricultural uses with an established primary use.

Land within a half-mile of the Cliff Siding Extension is designated Extensive Agriculture (Map Code 8.3) on the Kern County General Plan and is zoned Exclusive Agriculture (A) and Limited Agriculture (A-1). The Exclusive Agriculture (A) and Limited Agriculture (A-1) zoning districts are consistent with the General Plan land use designation and define areas that are suitable for agricultural uses. Land within a half-mile of the Cliff Siding Extension is currently vacant and used for low-intensity grazing, except for right-of-way uses associated with the existing railroad.

The Walong to Marcel segment of the project is within the Greater Tehachapi Area Specific Plan. Land within a half-mile of the Walong to Marcel segment is designated Resource Reserve (Map Code 8.2), Extensive Agriculture (Map Code 8.3), and Residential 20+ Gross Acres/Dwelling Unit Maximum (Map Code 5.8) on the Kern County General Plan and zoned Exclusive Agriculture (A), Limited Agriculture (A-1), and Residential Suburban (RS) Combining District with Estate 1 Acre (E[1]). Land within a half-mile of the Walong to Marcel segment is also currently vacant and used for low-intensity grazing, except for right-

of-way uses associated with the existing railroad.

The Kern County General Plan encourages development in areas near existing development (urban and suburban settings such as the City of Bakersfield and the City of Tehachapi), and discourages development in areas without adequate infrastructure or development that places a burden on public services (fire, sheriff, parks, libraries).

Consistency with State, Regional and Local Plans and Programs

State

California Goods Movement Action Plan

The California Goods Movement Action Plan addresses complex issues surrounding goods movement in California and establishes a "Framework of Action" intended to generate jobs, increase mobility and relieve traffic congestion, improve air quality and protect public health, enhance public safety, and improve California's quality of life. The improvements proposed along the Tehachapi Trade Corridor are consistent with the goals outlined the California Goods Movement Action Plan. In addition, the project qualifies for use of the California Transportation Commission and Transportation Corridor Improvement Fund that are designated to support meritorious goods movement infrastructure projects. Project improvements would help solve the infrastructure needs and enhance rail freight movement across the Tehachapi Trade Corridor.

State Senate Concurrent Resolution No. 17 – Oak Woodlands

State Senate Concurrent Resolution No. 17 – Oak Woodlands requires state agencies having land use planning duties and responsibilities to assess and determine the effects of their decisions or actions within any oak woodlands containing Blue, Engleman, Valley, or Coast Live Oak. The goal is to preserve and protect native oak woodlands to the maximum extent feasible, or provide replacement plantings where designated oak species are removed from oak woodlands. Impacts to oak trees are discussed in Sections 2.1.7 and 2.3.1 of this document.

Local

City of Tehachapi Downtown Master Plan

The purpose of the Master Plan is to establish a blueprint for revitalization of the downtown area and make it an inviting place for both visitors and locals. The Master Plan is intended to guide growth and development, and create a comprehensive and unified style to the downtown area. It facilitates and encourages development and improvements that display the community's vision for the downtown. The project would not conflict with any of the goals or implementation plans of the Master Plan.

City of Tehachapi General Plan

The City's General Plan establishes goals, implementation strategies and policies to guide the future growth within Tehachapi. The General Plan has an initial planning horizon of 2035 but, according to the General Plan Update Environmental Impact Report, the plan is not intended to specify or anticipate when build-out will actually occur. Based on a review of the City of Tehachapi's General Plan and the analysis that was done for this project, the project does not conflict with any of the objectives or policies outlined in the General Plan.

Kern County General Plan (amended September 2009)

The Kern County General Plan consists of the Land Use, Open Space, and Conservation Element, Circulation Element, Noise Element, Safety Element, Housing Element, Energy Element, and Kern River Plan Element. The General Plan is a composite of many policies, programs and intended actions governing and guiding the future physical development of about 5 million acres of the unincorporated area of Kern County. The project would not conflict with any land use plans, policies, or regulations outlined in the General Plan. Railroad right-of-way uses are allowed under the existing land use and zoning designations.

Greater Tehachapi Area Specific Plan

The Greater Tehachapi Area Specific Plan establishes goals, implementation strategies and policies to guide the future growth within the unincorporated areas of surrounding Tehachapi. The Specific Plan, which covers the areas of Alpine Forest, Bear Valley Springs, Brite Valley, Cummings Ranch, Cummings Valley, Golden Hills, Mendiburu Springs, Monolith, Old Towne, and Stallion Springs, is consistent with the goals, policies and guidelines of Kern County's General Plan. The project would not conflict with any plans, policies, or regulations outlined in the Specific Plan.

Kern County Floodplain Management Ordinance

Under California State Government Code Sections 65302, 65560, and 65800, local government has the authority to adopt regulations designed to promote the public health, safety, and general welfare of its citizenry. Under this statute, Kern County has established regulations for the management of floodplains within its jurisdiction. The purpose of the Kern County Floodplain Management Ordinance is to reduce the risk to human health, safety and welfare, including but not limited to reducing the damage to public facilities, reducing the need and cost of emergency efforts associated with floods, and to comply with the requirements of the National Flood Insurance Program Regulations, Parts 59 and 60 of Title 44 of the Code of Federal Regulations. The project would not conflict with the Kern County Flood Management Ordinance or any of the methods and provisions associated with the ordinance.

Kern County Oak Tree Conservation Policy

Consistent with the State Senate resolution, Kern County also aims to protect native oak woodlands to the maximum extent feasible. Although the county ordinance does not apply to the railroad rights-of-way and this project, it provides a reasonable approach to characterization and mitigation of impacts to oak woodland resources. Any removed oaks would be replaced in a manner that is consistent with all applicable regulations. So, neither the Build Alternative nor the Reduced-Segment Alternative would conflict with Kern County's Oak Tree Conservation Policy.

Environmental Consequences

The California Environmental Quality Act Guidelines require an assessment of whether the project would result in significant impacts related to land use. In particular, the California Environmental Quality Act Guidelines Appendix G is concerned with the potential for the project to conflict with any applicable land use plans, policy, or other regulation, as well as the potential for a project to divide any established communities.

Build Alternative

Construction and Operational Impacts

Construction and implementation of the project would not greatly change land uses in the surrounding area. The future land use designation surrounding the project area would remain consistent with the Land Use Element of the Kern County General Plan. But, the project would remove a certain amount of acreage from current Williamson Act use and result in future use changes from the exclusive agricultural preserve function to non-agricultural uses (see Section 2.1.2, *Farmlands/Timberlands*).

Although most construction activities would occur within the existing railroad right-of-way, a small portion of the proposed work would occur on privately owned lands with agricultural grazing functions outside the existing railroad right-of-way. The total amount of land that would be acquired for construction (including grading, excavation, slope changes, extension of existing culverts) and operation of the project is about 4.26 acres. This minor amount makes up less than 3 percent of total area that would be affected by the project. This impact to land area designated for agricultural uses does not require further evaluation because the project would not affect prime farmlands and other farmland of statewide importance, as defined by the Natural Resources Conservation Service and the Williamson Act.

The proposed tracks would not result in any physical division to any greater extent than the tracks already divide the communities in the area. Established communities next to the existing rail alignment as well as current Kern County land use plans and policies would not be substantially affected by the construction or operation of the project. So, the project would

be compatible with the current Kern County General Plan. In addition, the project would not affect habitat conservation or natural community conservation plans (see Section 2.3, *Biological Resources*).

Reduced-Segment Alternative

Construction and Operational Impacts

Construction and operations would require the permanent acquisition of several small portions of parcels for right-of-way expansion totaling 2.04 acres. Similar to the Build Alternative, these parcels are right next to the existing rail right-of-way and are either vacant or used for low-intensity grazing. These areas would be added to the existing right-of-way and used for construction staging and buffer areas. Construction activities would not permanently alter the land use of the parcels, and land use designations or zoning changes would not occur. Furthermore, this alternative would not result in any unpermitted or incompatible land uses.

Similar to the Build Alternative, the construction and operation of the Reduced-Segment Alternative would not divide an established community or conflict with any land use plans, policies, or regulations.

No-Build Alternative

The No-Build Alternative would allow the continuation of existing rail services; no impacts to existing or future land uses are anticipated.

Avoidance, Minimization, and/or Mitigation Measures

None required.

2.1.2 Growth

Regulatory Setting

The California Environmental Quality Act also requires the analysis of a project's potential to induce growth. The California Environmental Quality Act Guidelines (Section 15126.2[d]), require that environmental documents "…discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment…"

Affected Environment

The project lies in portions of an unincorporated area of Kern County, within the Tehachapi Mountains. Two residences sit in the project area; the rest of the area is mostly unimproved agricultural grazing land.

Environmental Consequences

This project does not provide any urban services, roadways, or infrastructure that would change accessibility in the project area. The infrastructure is designed to support long-haul (traveling more than 450 miles) freight trains. There is no rail passenger service in this corridor, and none is planned. Therefore, the cost (in terms of time and money) of movement to, from, and within the project area would remain the same for the public and would not result in increased attractiveness to developers, consumers, or recreationists for the Build, Reduced-Segment and No-Build Alternatives.

Avoidance, Minimization, and/or Mitigation Measures

Due to the type and size of the transportation improvements proposed, the project is not expected to result in growth-related impacts to population, housing or employment in the project area. While accessibility would be affected as discussed in Sections 2.1.5, *Utilities/Emergency Services* and 2.1.6, *Traffic and Transportation/Pedestrian and Bicycle Facilities*, the project would not change access or travel times in a way that would contribute to growth. Therefore, no avoidance, minimization, and/or mitigation measures are proposed.

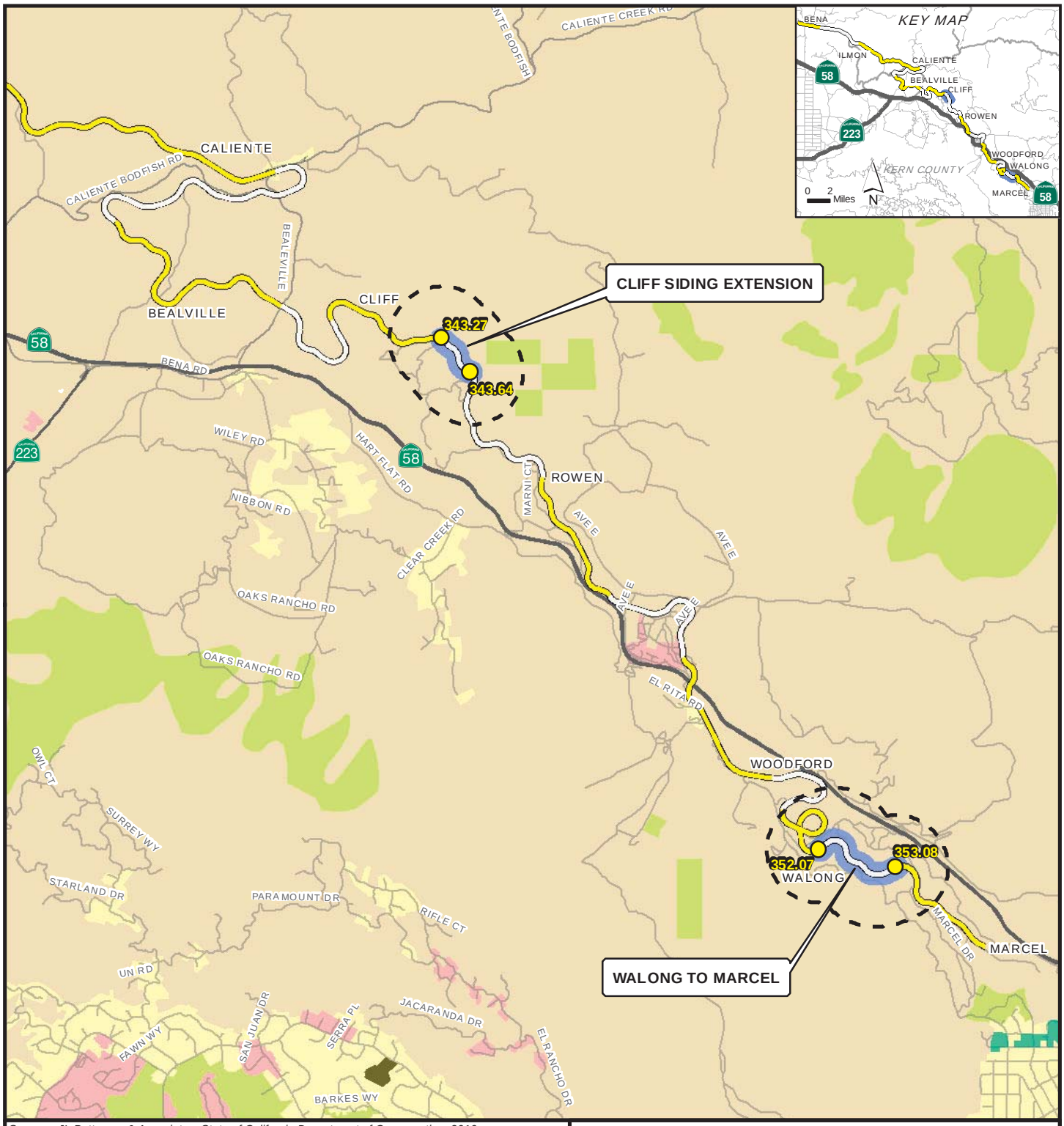
2.1.3 Farmlands/Timberlands

Regulatory Setting

The California Environmental Quality Act requires the review of projects that would convert Williamson Act contract land to non-agricultural uses. The main purposes of the Williamson Act are to preserve agricultural land and to encourage open space preservation and efficient urban growth. The Williamson Act provides incentives to landowners through reduced property taxes to discourage the early conversion of agricultural and open space lands to other uses.

Affected Environment

The existing project footprint is an active railroad. It is not classified as Prime Farmland, Farmland of Statewide Importance, Unique Farmland, or Farmland of Local Importance, as defined by the Farmland Mapping and Monitoring Program. The farmland study area is predominately classified as Grazing Land under the Farmland Mapping and Monitoring Program (Figure 2.1-3). Near the Cliff Siding Extension, the project is not located on lands classified as Prime Farmland or Non-Prime Farmland under the Williamson Act (Figure 2.1-4).



Sources: JL Patterson & Associates; State of California Department of Conservation, 2010

Legend

BNSF TEHACHAPI

- Segment Milepost
- Farmlands Study Area
- Project Segments
- Existing Single Track Not in Project
- Existing Double Track Not in Project
- Highway
- Road

Kern County Farm Lands 2010

- Urban and Built-Up Land (D)
- Grazing Land (G)
- Nonagricultural and Natural Vegetation (nv)
- Semi-Agricultural and Rural Commercial Land (sAC)
- Vacant or Disturbed Land (V)
- Rural Residential Land (R)

0 1.3 Miles

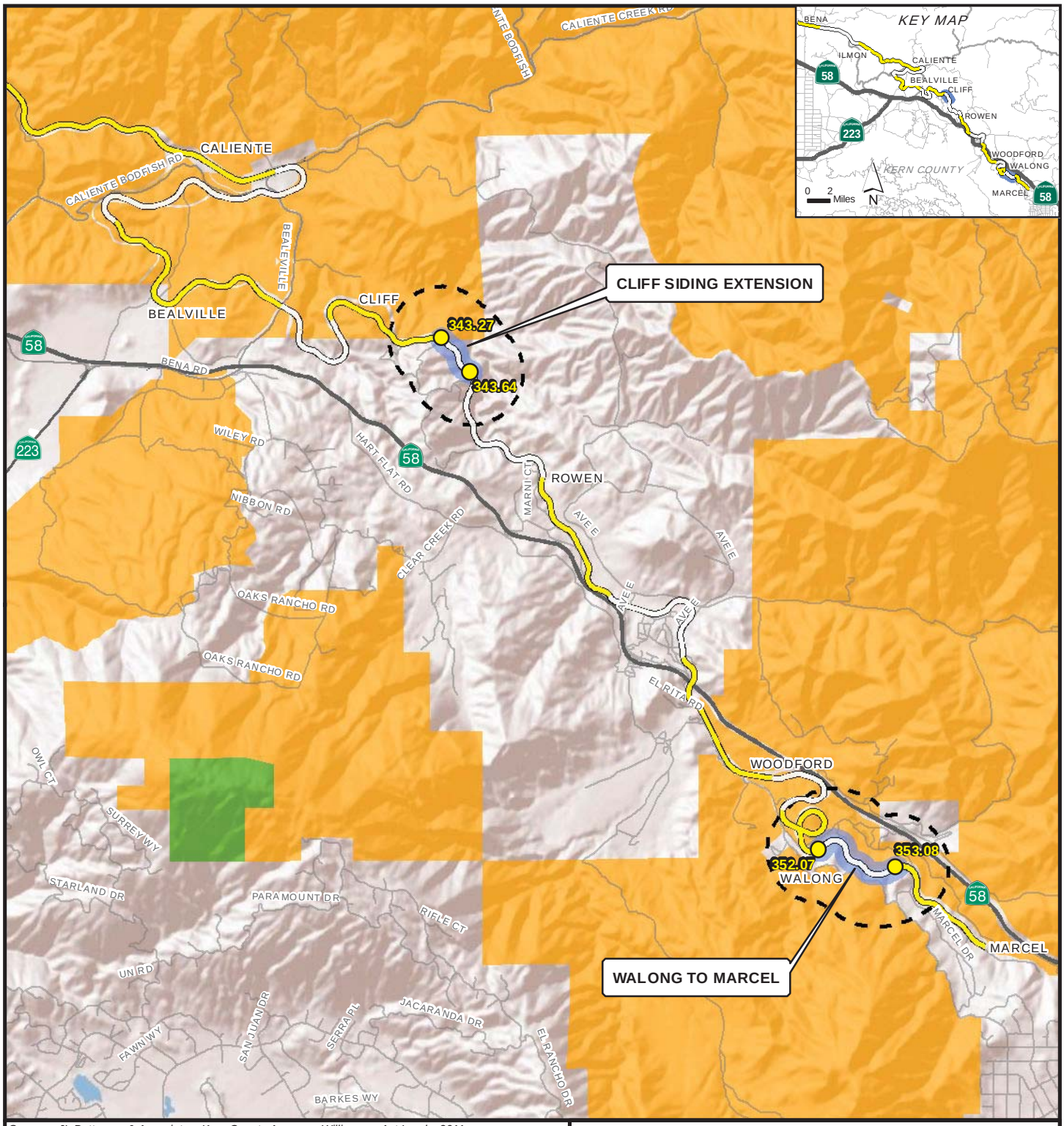
BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Important Farm Lands

March 2013

Figure 2.1-3

Caltrans



Sources: JL Patterson & Associates; Kern County Assessor Williamson Act Lands, 2011.

Legend

BNSF TEHACHAPI

- Segment Milepost
- Farmlands Study Area
- Project Segments
- Existing Single Track Not in Project
- Existing Double Track Not in Project
- Highway
- Road

Kern County Williamson Act Lands 2011

- Williamson Act Prime Land
- Williamson Act Non-Prime Land

0 1.3 Miles

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Williamson Act Lands

March 2013

Figure 2.1-4

Caltrans

A portion of the farmland study area to the northeast of the project footprint is classified as Non-Prime Farmland. Most of the farmland study area near the proposed Walong to Marcel improvements is classified as Non-Prime Farmland under the Williamson Act, while a small amount of land to the southeast is not classified as either Prime or Non-Prime Farmland under the Williamson Act.

Environmental Consequences

Build Alternative

Construction and Operational Impacts

A Farmland Conversion Impact Rating for Corridor Type Projects was completed. The purpose of this assessment was to determine the magnitude of impact to farmlands that each project alternative would have. Based on the Corridor Assessment Criteria identified on the form, this project alternative would result in a rating of 45 points (out of a total of 160 points) and therefore would not result in a substantial impact to farmlands.

The project would affect portions of five parcels outside of the railroad right-of-way including two that are contracted under the Williamson Act. Construction and operation of the second track would result in permanent acquisition of the lands outside the railroad right-of-way. The total amount of disturbance outside the existing right-of-way is approximately 4.26 acres of agricultural land that would be permanently converted to non-agricultural uses. About 45 percent of the affected area falls under Williamson Act contracts as shown in Figure 2.1-4 Williamson Act Lands. All of the areas affected by the Williamson Act contracts are classified as non-prime farmlands.

Table 2.1-1 lists the Williamson Act parcels and acreages affected by the project. The percentage of Williamson Act take for each parcel is less than five percent for all parcels. As shown in Table 2.1-2, the total percentage of Williamson Act lands affected by permanent takes is approximately two percent of the combined total acreage of both affected Williamson Act parcels (1.93 acres out of 93.27 total acres) and less than 0.01 percent of the 2.7 million acres of inventoried agricultural lands reported in the Department of Conservation's 2004–2006 Land Use Conversion Table for Kern County.

Table 2.1-1 Project Takes and Williamson Act Land

Type of Take	Total Land Proposed to be Taken (Acres)	Williamson Act Lands Impacted	
		Acres	% of Total Land Proposed to be Taken
Permanent acquisitions—Cliff Siding Extension	2.22	0	0%
Permanent acquisitions—Walong to Marcel	2.04	1.93	95%
Permanent Acquisitions Total	**4.26**	**1.93**	**45%**

Source: Kern County Assessor File, 2008

Table 2.1-2 Williamson Act Lands Potentially Affected by the Project

Assessor's Parcel Number	Project Segment	Total Parcel Acreage	Permanent Acquisitions	
			Acres	% of Entire Parcel
505-050-04	Walong to Marcel	59.36	0.86	1.45%
505-050-18	Walong to Marcel	33.91	1.07	3.16%
Totals		**93.27**	**1.93**	**2.07%**

Source: Kern County Assessor File, 2008

The Williamson Act program restricts land uses to agricultural-related uses. A railroad right-of-way is not a permitted land use under the Williamson Act program and would be considered a breach of the Williamson Act contract. In addition, under the California Environmental Quality Act, the impact threshold is whether Williamson Act land would be converted to non-agricultural use, independent of how much of the parcel is used or if the portion needed is next to railroads. However, there exists a mechanism within the Williamson Act program that allows land to be acquired by public agencies for other uses (Department of Conservation 2013). Parcels required in full or in part for the project that are

under a Williamson Act contract would be subject to property acquisition in accordance with the applicable provisions of this program.

In this case, BNSF and UPRR must advise the Director of Conservation and the County Board of Supervisors of their intention to consider the location of a railway facility on the agricultural land. When the Williamson Act contract land is condemned or acquired under threat of condemnation, the lands would no longer be used for agricultural preserve function as specified under the Williamson Act contract. In accordance with state law, BNSF and UPRR will comply with notification and findings requirements for any proposed future acquisition of Williamson Act contract lands. A fee equal to 12.5 percent of the unrestricted current fair market value of the land would be assessed for the cancellation of the contract.

The Build Alternative would convert less than one percent of affected Williamson Act parcels to nonagricultural/right-of-way uses. Since these Williamson Act parcels sit near the edges of the existing railroad right-of-way uses and are not designated as prime farmlands, the conversion of these parcels would not reduce the value and function of these lands.

In addition, since identified parcels are next to existing rail rights-of-way, it is unlikely that the project would cause segmentation of agricultural lands and potential indirect effects associated with segmentation. Project impacts to farmlands would be minimal due to the small amount of acreage affected and the location of the parcels.

Reduced-Segment Alternative

A Farmland Conversion Impact Rating for Corridor Type Projects was completed for the project. Based on the Corridor Assessment Criteria identified on the form, this project alternative would result in a rating of 45 points (out of a total of 160 points) and therefore would not result in a substantial impact to farmlands.

No-Build Alternative

Under the No-Build Alternative, no project improvements would occur. The non-prime farmlands classified as grazing lands by the Farmland Mapping and Monitoring Program would remain grazing farmlands. No impact would occur to the farmlands, which would be preserved for agricultural use.

The Williamson Act provisions would continue to preserve lands that are covered under a Williamson Act contract. Removal of the approximately 1.93 acres of land under Williamson Act contracts would not occur.

Avoidance, Minimization, and/or Mitigation Measures

No mitigation for impacts to farmland is required.

2.1.4 Community Impacts

Relocations and Real Property Acquisition

Regulatory Setting

The Caltrans Relocation Assistance Program is based on the Federal Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (as amended) and Title 49 Code of Federal Regulations Part 24. The purpose of the Relocation Assistance Program is to ensure that persons displaced as a result of a transportation project are treated fairly, consistently, and equitably so that such persons will not suffer disproportionate injuries as a result of projects designed for the benefit of the public as a whole. All relocation services and benefits are administered without regard to race, color, national origin, or sex in compliance with Title VI of the Civil Rights Act (42 U.S. Code 2000d, et seq.). See Appendix B for a copy of the Caltrans' Title VI policy statement and Appendix G for a summary of the Relocation Assistance Program.

Affected Environment

The project encompasses the Walong to Marcel and Cliff Siding Extension segments in unincorporated Kern County. Approximately 4.26 acres of property acquisitions for additional right-of-way is needed to double-track two rail segments totaling 1.38 miles in the Tehachapi Pass between Bakersfield and Mojave. Identified permanent acquisition parcels are mainly privately owned grazing lands and are either occupied with agricultural grazing functions or vacant.

Environmental Consequences

Build Alternative

Construction activities for the Build Alternative would affect portions of five parcels of land totaling 4.26 acres (see Table 2.1-3). These parcels are right next to the existing rail right-of-way and are either vacant or used for low-intensity grazing. Permanent acquisition of these parcels for right-of-way expansion is required. Acquired acreages would be added to the existing right-of-way. Table 2.1-3 lists the land parcels and acreages that would be acquired as a result of this project. No displacement or relocation will occur as a result of parcel acquisitions.

Table 2.1-3 Permanent Acquisitions

Segment	APN	Owner	Acreage
Cliff Siding Extension	504-010-19	Cummings, Steven Kimberly	2.09
Cliff Siding Extension	504-010-21	Loop Ranch LLC	0.13
Walong to Marcel	505-050-04	Loop Ranch, LLC	0.86
Walong to Marcel	505-050-18	Loop Ranch, LLC	1.07
Walong to Marcel	505-160-01	Combs Leslie E and Sharon L	0.11
		Total	4.26

Source: Kern County Assessor File, 2008

Construction and Operational Impacts

Most construction activities would be within the existing railroad right-of-way. A small portion of the proposed activities would occur outside of the railroad right-of-way in areas that are mainly privately owned agricultural lands or vacant. Construction and operation of the project would not include the relocation or displacement of persons, housing, or businesses.

Reduced-Segment Alternative

Similar to the Build Alternative, most construction activities would be within the existing railroad right-of-way, but a small portion of the proposed activities would occur along rural grazing lands outside of the current railroad right-of-way. However, the property take does not include the relocation or displacement of persons, housing, or businesses. No impacts related to relocations and real property acquisition would occur under the Reduced-Segment Alternative.

No-Build Alternative

Under the No-Build Alternative, no property would be acquired.

Avoidance, Minimization, and/or Mitigation Measures

BNSF would follow the process used by Caltrans to address property acquisition:

- The Uniform Relocation Assistance and Real Property Acquisitions Policies Act (Uniform Act) of 1970 (Public Law 91-646, 84 Stat. 1894) mandates that payments be made available to eligible residents, businesses, and nonprofit organizations displaced or affected by projects. The Uniform Act provides for equitable land acquisition policies.
- Where acquisition is unavoidable, the provisions of the Uniform Act and the 1987 Amendments as implemented by the Uniform Relocation Assistance and Real

Property Acquisition Regulations for Federal and Federally Assisted Programs adopted by the Department of Transportation on March 2, 1989 will be followed. An independent appraisal of the affected property will be obtained, and an offer for the full appraisal will be made.

2.1.5 Utilities/Emergency Services

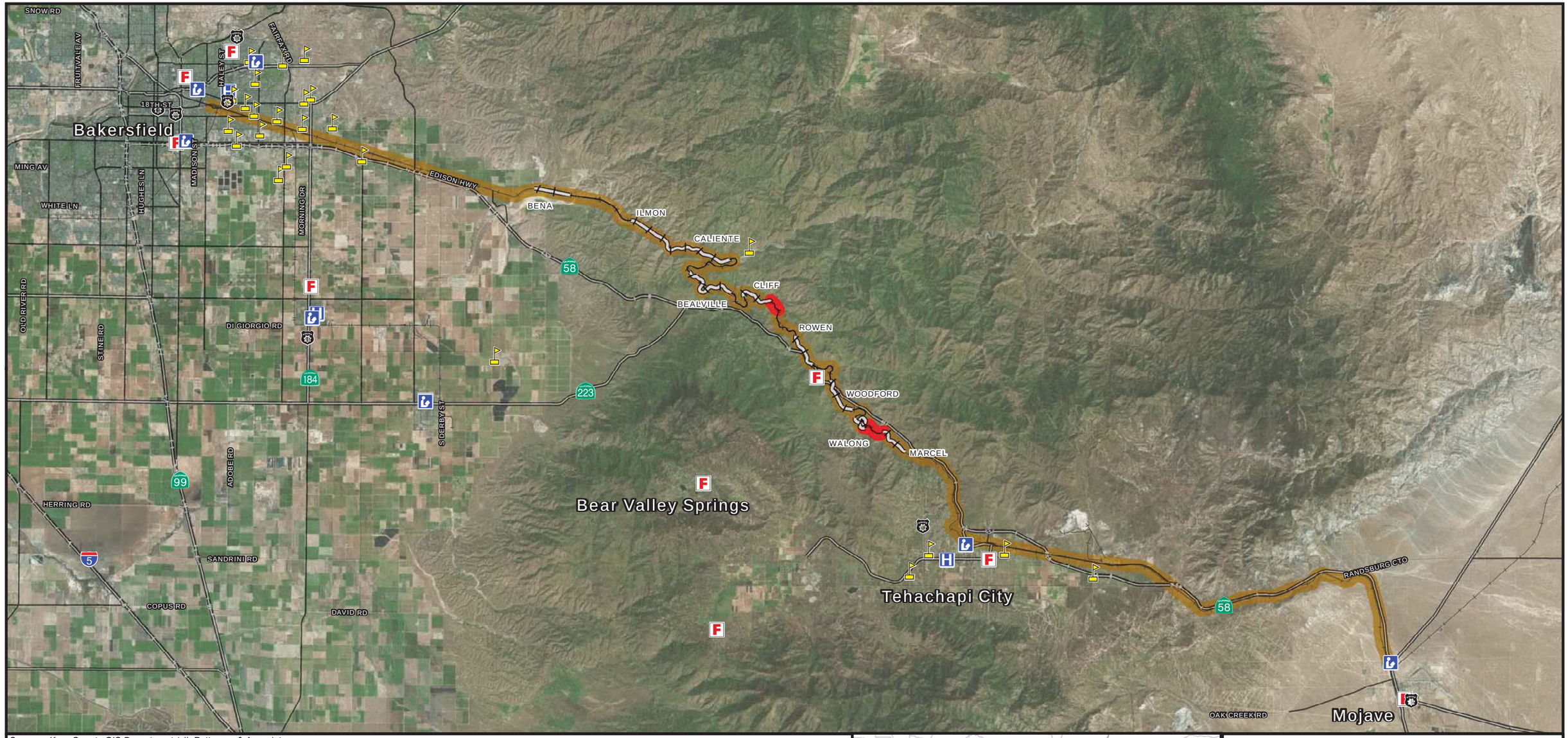
The following section discusses the affected environment and the environmental considerations of the utilities and emergency services provided in the area as they relate to the project. This section also discusses any avoidance, minimization, and/or mitigation measures recommended to reduce any project-related impacts to utilities and emergency services.

Affected Environment

The project rail segments would sit within the unincorporated areas of Kern County. Utility and public services, including emergency services, are either provided by Kern County or a variety of other local agencies and providers. Utilities represent vital infrastructure for communities, and projects that result in increased demands placed upon freshwater supplies, solid waste, sewage, and storm water drainage could create significant environmental impacts. Projects that require the expansion or modification of these resources could create significant environmental impacts.

Emergency services are vital in the operation of cities and counties. These include fire, police, and ambulance services. Operational characteristics of a project that result in excessive traffic delays during times of an emergency could pose a significant risk to the health, safety, and welfare of a community, and could have an adverse effect on the environment if the demand for additional emergency services requires the alteration, expansion, or construction of new emergency services facilities such as police or fire stations.

Public facilities near the project are described below and shown in Figure 2.1-5.



Sources: Kern County GIS Department / JL Patterson & Associates

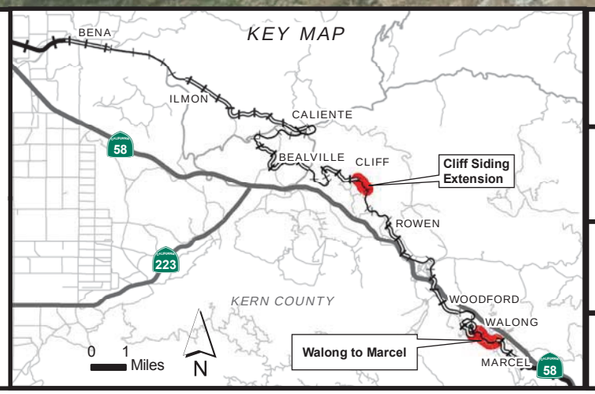
Legend

- Libraries
- Sheriff Stations
- Schools
- Health
- Fire Stations

BNSF TEHACHAPI

- Segment Milepost
- Project Segments
- Existing Single Track Not in Project
- Existing Double Track Not in Project
- Tehachapi Corridor
- Highway
- Road

0 4 8
Miles



BNSF/UPFF Mojave Subdivision Tehachapi Rail Improvement Project

Tehachapi Public Services

March 2013

Figure 2.1-5

Caltrans

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Public Services

Hospitals

The hospital nearest to the project is the Tehachapi Surgery Hospital at 20960 Sage Lane in the City of Tehachapi. The hospital is about 5 miles southeast of the Walong to Marcel segment and over 10 miles southeast of the Cliff Siding Extension. The hospital is in the process of being relocated from its current location in the center of the city and south of the railroad tracks to a relatively remote location north of the railroad tracks. Once the hospital has been relocated, the former hospital facility will be used as an outpatient facility. No hospitals sit within a 2-mile radius of the project.

Solid Waste

The Kern County Waste Management Department manages the local solid waste services and operates seven landfills, five transfer stations, four transfer bins, and two special waste facilities sites in the county. Solid waste generated by the surrounding communities is disposed of at any of the three landfills near the project: Bakersfield Metropolitan (Bena) Landfill, Tehachapi Landfill, and Mojave-Rosamond Landfill. All three are permitted as Class III facilities and have a combined design capacity of 4,912 tons per day. Class III landfills accept only non-hazardous solid waste for disposal. Special wastes would be transported to the Kern County Special Waste Facility Eastern Region in Mojave.

Water

Areas near the project are served by a variety of water purveyors, including the Kern County Water Agency, Golden Hills Community Services District and Tehachapi-Cummings County Water District. Water also comes from several areas in the Greater Tehachapi Area of Kern County, including the Brite Valley Basin and the Tehachapi Valley Groundwater Basin, as well as water from the California State Water Project (Kern County 2008).

Sewer and Stormwater

Cities outside of the project area are typically served by sewer collection and treatment services, but rural areas of Kern County and the greater Tehachapi area use single- and multiple-source septic tank systems for sewage treatment (Kern County 2008). In addition, no central stormwater drainage systems operate within the project. Existing culverts provide for some minor stormwater runoff relief to reduce runoff impacts to the rail road system and the adjacent railroad right-of-way.

Emergency Services

Fire Protection

The California Department of Forestry identifies the degree of fire risks based on the severity of fire hazard that is expected to prevail. Fire zones are identified based on factors such as fuel (material that can burn), slope, and fire weather. Fire Hazard Severity Zone Maps developed by the California Department of Forestry show that most of the project area is within fire-prone areas. The two project segments—Cliff Siding Extension and Walong to Marcel—are in an area classified as a Fire Hazard Severity Zone. Minimization measures, including a Fire Suppression Management Plan (noted in Section 2.2.5, Hazardous Waste and Materials), implemented during the project's construction phase would reduce impacts from potential wildfire hazard.

The Kern County Fire Department would respond to any and all fire emergencies in the study area and project segment areas. In some cases, the Bureau of Land Management may respond to fires in the Cliff Siding Extension segment, which is right next to U.S. Bureau of Land Management property. The Kern County Fire Department participates in the State Master Mutual Aid System and has agreements with surrounding jurisdictions, including the U.S. Forest Service, which may also serve the area as needed.

The Kern County Fire Department operates 46 fire stations. The station that serves the project area is the Keene Fire Station (FS#11) in the unincorporated area of Keene, at 30356 Woodford-Tehachapi Road, between the two project segments. There are also stations in the neighboring communities of Bear Valley Springs (FS#16), Stallion Springs (FS#18), and the City of Tehachapi (FS#12). Countywide policy ensures there is an average response time of 9 minutes within rural areas and 15 minutes in frontier areas. It is estimated that the average response time, given the distance, would be about 10 minutes from Keene to the Walong to Marcel segment, which is near Woodford-Tehachapi Road and Highway 18. Response times may be longer for the Cliff Siding Extension because there are no adjacent public roads; the response time would vary depending on a variety of factors, including existing road conditions and weather.

Police Protection

The Kern County Sheriff Department serves all of unincorporated Kern County and provides police protection services within the Tehachapi Trade Corridor. The East Area Section of the Kern County Sheriff Department, specifically the Tehachapi substation at 22209 Old Town Road in the community of Golden Hills, serves the area immediately surrounding the project. The Tehachapi substation provides police support for about 570 square miles of unincorporated lands throughout the Tehachapi Valley. In addition, allied agencies within the

region, including the California Highway Patrol and the Tehachapi Police Department, provide police services as needed. Response times for police services are estimated to range from 10 to 30 minutes, particularly in remote locations. Police response times are variable and depend on factors that include road conditions, proximity of the dispatched deputies to the area of need, accessibility to nearest highways and roads, and the terrain of the area in need. In addition, the mountainous terrain near the project means that police radio service can be inconsistent.

UPRR and BNSF also manage their own police forces, which provide private, internal security for railroad operations and infrastructure along their rights-of-way. These forces are also granted full police powers in California and would serve the project as part of their jurisdiction. Substations for these two police forces are not within the immediate vicinity of the project; the Kern County Sheriff Department would most likely be dispatched in the case of accidents or events of illegal trespassing occurring on railroad property.

The Tehachapi Police Department serves the nearest incorporated city to the project, the City of Tehachapi. The police station sits at 129 East "F" Street, south of the UPRR right-of-way that bisects the city.

Ambulatory/Emergency Response Services

Hall Ambulance Service, Inc. provides for about 90 percent of all Advanced Life Support (ALS) ambulance responses in Kern County. The main facility is in Bakersfield. Similar to police and fire, a variety of factors contribute to response times, including road conditions, proximity of the dispatched ambulances to the area of need, accessibility to nearest highways and roads, and the terrain of the area in need. In addition, Hall Ambulance Service provides emergency and non-emergency transportation, with corresponding target response times.

Environmental Consequences

Build Alternative

Construction and Operational Impacts

Hospitals

As noted earlier, the nearest hospital is more than 5 miles away from the project study area within the City of Tehachapi. The project would not close any public roadways accessing the hospital. The City of Tehachapi is relocating its only hospital, now centrally located south of the railroad tracks with most of the city's residential land uses, to a relatively remote location north of the railroad track. Because there are no grade-separated crossings within the city, accessibility to and from the hospital during train passings would be slightly longer, requiring

an average of 53 more seconds in gate-down time per train as a result of the more frequent passage of 8,000-foot trains.

Solid Waste

The project would not generate substantial amounts of solid waste. The project would move materials such as rocks, soil, and vegetative wastes, which would be trucked back to other segments of the project site and used as fill. Excess solid waste generated by the project would be disposed of at the Bakersfield Metropolitan (Bena) Landfill or the Tehachapi Landfill sites. Existing waste disposal facilities and operations are adequate to serve the needs of the project, so minimal impacts are expected to solid waste collection or disposal resources.

Water

The project may require the occasional use of water for mixing concrete, washing equipment and vehicles, controlling dust, and other activities. However, the amount of water used during construction on a daily basis would be minimal and would be purchased from one of the local water purveyors and trucked in during grading by water trucks. According to the Environmental Impact Report that was prepared for the Greater Tehachapi Area Specific Plan, there are adequate water supplies from local water purveyors to accommodate the demand and predicted growth within the region. Temporary demands for water created during construction would not require expansion or construction of additional water transmission facilities or water supplies.

Sewer and Stormwater

The project would not result in a substantial impact on any sewer infrastructure or stormwater systems. Construction activities would not demolish or disrupt any part of existing sewer systems, but may extend portions of existing drainage culverts for stormwater runoff to accommodate a wider right-of-way along isolated portions of the project. These would be minor extensions placed along rural areas and would not result in a change to stormwater runoff, as discussed in Section 2.2.1, *Hydrology and Floodplains,* and Section 2.2.2, *Water Quality and Stormwater Runoff.*

Fire Protection

The project would not close any public road or fire road access. Access to rural areas along the project segments would be similar to existing conditions, and no impacts would occur.

Construction of the project would not result in an increased demand for fire services. However, as described in the Affected Environment section, the two project construction

areas lie in a Fire Hazard Severity Zone. Minimization measures related to this hazard are addressed in Section 2.2.5, *Hazardous Waste and Materials*, and include preparation of a Fire Suppression Management Plan. This plan would limit potential risks of fire to result in no impacts to fire protection services.

Police Protection

The project would not close any public road or fire road access; access along rural areas would be similar to existing conditions.

Ambulatory/Emergency Response Services

The project would not close any public road or fire road access. Access to rural areas along the project segments would be similar to existing conditions. Construction of the project would not result in an increased demand for ambulance services.

The project would result in increased gate-down time as a result of the higher volume of longer trains that would be passing through the corridor. Currently, up to two 8,000-foot trains travel through the corridor daily; once the project were completed, up to 12 8,000-foot trains could come through each day.

A grade crossing analysis was done at Dennison Road and Green Street in the City of Tehachapi and at Morning Drive in unincorporated Kern County. These intersections experience a moderate to high number of vehicle turns that could be affected by future delays and represent other intersections within the City of Bakersfield and Tehachapi. Gate-down times at the three study locations ranged from 1 minute to nearly 7 minutes; average gate-down time for the three locations was 3:02 minutes. The future average gate-down time at each study intersection would increase approximately 53 seconds, resulting in an average gate-down time of 3:55 minutes.

No federal regulation addresses blocked rail crossings. The State's authority to legislate or regulate blocked crossings is still being defined in the courts. According to the Federal Railroad Administration's study *Impact of Blocked Highway/Rail Grade Crossing on Emergency Response Services*, "Emergency responders can be delayed by many things: availability of units, highway traffic, dispatching delays or errors and weather. Delays due to highway-railroad crossings are no different in effect than delays due to other causes." Regardless, substantially increased delays from the project could have an impact on emergency services within the city.

The City of Tehachapi could be affected by the project as a result of delays occurring at the at-grade intersections. The blocked crossings within the City of Tehachapi are the result of

older infrastructure and development. When trains pass through town at the at-grade crossings, vehicles have limited access to various neighborhoods north of the railroad tracks that were built after the railroad corridor was established. Access can affect emergency services too. Emergency services within the city are all south of the railroad track, which results in potentially increased delays to isolated neighborhoods on the other side of at-grade crossings. With the hospital relocating to a remote location in the northern portion of the city, accessibility to the hospital would be further constrained.

To address emergency response concerns, an Alternative Routes Analysis within the City of Tehachapi compared the existing and projected future emergency response condition, particularly for fire response, and evaluated the effectiveness of using a predetermined alternative route, should an emergency situation occur the same time a train crossed. The City of Tehachapi was specifically analyzed because the unique arrangement of land uses within the city relative to the railroad tracks prohibits emergency responders from using the most direct route to access areas north of the railroad while a train is passing. Fire Station #12, at 800 South Curry Street in the city, was analyzed as a part of the alternative route analysis, as well as the existing and future location of the city's hospital.

Kern County Emergency Medical Service divides the county into five separate response zones: Metro, Urban, Suburban, Rural, and Wilderness. Within each zone, several Priority Codes have been established. The first three Priority Codes are used for pre-hospital emergency calls; Priority Codes 4 through 7 are used for non-emergency calls. The City of Tehachapi, like the City of Bakersfield, is considered to be in the Metro time zone[3]. According to the Kern County Emergency Medical Service, a Priority 1 call in the Metro time zone has the most stringent time requirement of 8 minutes and 59 seconds for emergency response.

The Transportation Impact Assessment concluded that it is typically more efficient to use the at-grade route during an emergency even if it occurs when a train passes. Each scenario concluded that emergency responders were able to access neighborhoods considered to be at-risk for purposes of the analysis within the 8-minute-and-59-second timeframe allotted for emergency response teams to respond to Priority 1 calls within the city. Therefore, despite the increase in gate-down time, the project would be consistent with established emergency response goals. Impacts to emergency response services would not be substantial, given the existing conditions and the minor increases in gate-down time associated with the project.

[3] Source: David Konieczny, Assistant Operations Manager – Hall Ambulance (661) 322-8741. Telephone communication with Dustin Kay of URS, February 7, 2013 and February 19, 2013.

Reduced-Segment Alternative

Construction and Operational Impacts

Impacts for the Reduced-Segment Alternative would be similar to those under the Build Alternative. No impacts to public utilities such as schools, libraries or hospitals would occur. The Reduced-Segment Alternative would result in impacts similar to what would occur under the Build Alternative in regard to solid waste, water, and sewer/storm runoff. The Reduced-Segment Alternative would not have substantial impacts to emergency services. With the Reduced-Segment Alternative, the gate-down time would increase by an average of 29 seconds when a train passes, from 3:02 minutes to 3:31 minutes. Based on the findings of the Alternative Routes Analysis, a 29 second increase is considered minor.

No-Build Alternative

Under the No-Build Alternative, the addition of a double-track would not occur. Rail services would continue to operate under existing conditions with no track improvements, as defined under the BNSF and UPRR operation plan. Under the Build Alternative, new construction and operational impacts would not occur to operations or services provided by public or emergency service agencies serving the project areas. However, minor delays to emergency response services will continue to occur regardless of whether the project is built because of continually increasing railroad traffic.

Avoidance, Minimization, and/or Mitigation Measures

Impacts related to temporary road closures, detours, and private driveways expected to occur at the time of project construction would be addressed by minimization measures included in the Traffic Management Plan prepared and implemented as part of the project (as noted in Section 2.1.6, *Traffic and Transportation*) and the minimization measure for a Fire Suppression Management Plan (as noted in Section 2.2.5, *Hazardous Waste and Materials*).

2.1.6 Traffic and Transportation/Pedestrian and Bicycle Facilities

Regulatory Setting

Caltrans, as assigned by the Federal Highway Administration, directs that full consideration should be given to the safe accommodation of pedestrians and bicyclists during the development of federal-aid highway projects (see 23 Code of Federal Regulations 652). It further directs that the special needs of the elderly and the disabled must be considered in all federal-aid projects that include pedestrian facilities. When current or anticipated pedestrian and/or bicycle traffic presents a potential conflict with motor vehicle traffic, every effort must be made to minimize the detrimental effects on all highway users who share the facility.

In July 1999, the U.S. Department of Transportation issued an Accessibility Policy Statement pledging a fully accessible multimodal transportation system. Accessibility in federally assisted programs is governed by the U.S. Department of Transportation regulations (49 CFR Part 27) implementing Section 504 of the Rehabilitation Act (29 U.S. Code 794). The Federal Highway Administration has enacted regulations for the implementation of the 1990 Americans with Disabilities Act (ADA), including a commitment to build transportation facilities that provide equal access for all persons. These regulations require application of the ADA requirements to federal-aid projects, including Transportation Enhancement Activities.

Affected Environment

A Traffic Impact Assessment (May 2013) was prepared for the project and has been attached in the Combined Technical Reports section of this Environmental Impact Report (Appendix D). The report presents the results of existing and future traffic conditions within the Tehachapi Trade Corridor. The project would not result in a direct or indirect increase in automobiles, so it would not induce permanent traffic increases along roadways. However, it is important to consider the result of longer trains traveling through the corridor and effect the project will have on the surrounding roadway network. The Traffic Impact Assessment focused on several topics:

- Intersection Analysis (including Queuing Analysis)
- Roadway Segment Analysis
- Emergency Access and Response
- Grade Crossing Analysis

Double-tracking two of the nine existing single-track segments of the Tehachapi Trade Corridor would affect the Tehachapi Pass because a higher volume of longer trains would be accommodated. The project would not induce permanent increases to vehicular traffic, but it would allow for an increased volume of longer trains per day through the Tehachapi Trade Corridor. The longer trains would require longer gate-down times, which could contribute to increased congestion at certain City of Tehachapi and county intersections that interface with the railroad. The following intersections could be affected:

- Morning Drive at Mills Street
- Morning Drive at Edison Highway
- Morning Drive at Brundage Lane
- Comanche Drive at Edison Highway

- Comanche Drive at State Route 58 westbound Ramp
- Green Street at H Street
- Green Street at Tehachapi Boulevard
- Hayes Street at Tehachapi Boulevard
- Dennison Street at Tehachapi Boulevard

Existing weekday morning and evening peak hour traffic counts were collected for the project in 2013. The weekday peak hour traffic volumes reflect typical weekday operations during current conditions. Street system operating conditions are typically described in terms of Level of Service (LOS), a rating scale used to indicate the quality of traffic flow on roadway segments and at intersections. LOS ranges from LOS A (free flow, little congestion) to LOS F (forced flow, extreme congestion).

Table 2.1-4 shows the relationship between LOS and the performance measures for intersections with and without signals. Table 2.1-5 summarizes the results of the LOS analysis for existing conditions.

Table 2.1-4 Level of Service Definitions

Level of Service	Intersection with Signals Control Delay (in seconds per vehicle)	Intersection without Signals Control Delay (in seconds per vehicle)
A	0 – 10	0 – 10
B	10.1 – 20	10.1 – 15
C	20.1 – 35	15.1 – 25
D	35.1 – 55	25.1 – 35
E	55.1 – 80	35.1 – 50
F	80 or more	50 or more

As stated in the Greater Tehachapi Area Specific Plan, Kern County has designated LOS D as the minimum standard for its system of highways and roads. The City of Tehachapi has designated LOS C as the minimum standard for city facilities. Caltrans maintains a target LOS between LOS C and LOS D on state routes. For the Kern Council of Government's Regional Transportation Plan, LOS E is the minimum systemwide standard in the Kern County Congestion Management Plan.

Table 2.1-5 indicates that all study intersections currently operate within the LOS standards of the city and county during the morning and afternoon peak hours.

Table 2.1-5 Existing Traffic Volumes at Intersections

Intersection	Morning Peak Hour				Afternoon Peak Hour			
	Average		Poorest Movement		Average		Poorest Movement	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Morning Drive at Mills Street	23.1	C	N/A	N/A	17.3	B	N/A	N/A
Morning Drive at Edison Highway	24.4	C	N/A	N/A	27.0	C	N/A	N/A
Morning Drive at Brundage Lane	19.9	B	N/A	N/A	19.6	B	N/A	N/A
Comanche Drive at Edison Highway	8.2	A	N/A	N/A	7.8	A	N/A	N/A
Comanche Drive at State Route 58 WB Ramp	3.7	A	9.5	A	3.7	A	10.5	B
Green Street at H Street	5.9	A	11.0	B	7.0	A	13.2	B
Green Street at Tehachapi Boulevard	8.4	A	11.3	B	10.0	A	13.9	B
Hayes Street at Tehachapi Boulevard	1.3	A	10.1	B	1.2	A	11.8	B
Dennison Street at Tehachapi Boulevard	7.7	A	N/A	N/A	8.6	A	N/A	N/A

Delay based on seconds per vehicle average.
N/A= Not applicable. Poorest Movement does not apply for four-way stop and intersections with signals.

Freeways Segments

According to the Greater Tehachapi Area Specific Plan, in 2007, heavy truck traffic represented approximately 34 percent of the total traffic on State Route 58. This four-lane divided freeway crosses the county on an east-west alignment. State Route 58 also serves as an alternative route to and from the Central Valley when Interstate 5 is closed due to weather or an accident. The Greater Tehachapi Area Specific Plan states the existing average daily traffic count on State Route 58 in the Greater Tehachapi area to be approximately 23,000 vehicles per day. Within the Greater Tehachapi Area, State Route 58 has interchanges at Sand Canyon Road, East Tehachapi Boulevard, North Mill Street and State Route 202. A future interchange is planned at Dennison Road, which is currently an undercrossing.

Freeway and roadway segments use LOS ratings as a qualitative measure to describe the condition of traffic flow, ranging from excellent conditions at LOS A to overloaded conditions at LOS F. LOS D is recognized as an acceptable service level in urban areas. The definition of LOS for roadway segments is based on a ratio of volume to capacity (V/C). The V/C ratio is the number of vehicles that travel on a transportation facility divided by the full vehicular capacity of that facility (the number of vehicles the facility was designed to convey). Table 2.1-6 shows the V/C ratio grouping that would correspond to each LOS category. Table 2.1-7 through 2.1-9 show the LOS along State Route 58 through the Tehachapi Pass.

Table 2.1-6 Level of Service (LOS) and Volume to Capacity (V/C) Ratio Definition

LOS	Volume to Capacity Ratio	Category	Definition
A	0.000−0.600	Excellent	No vehicle waits longer than one red light, and no approach phase is fully used.
B	0.601−0.700	Very Good	An occasional approach phase is fully used; many drivers begin to feel somewhat restricted within groups of vehicles.
C	0.701−0.800	Good	Occasionally drivers may have to wait through more than one red light; backups may develop behind turning vehicles.
D	0.801−0.900	Fair	Delays may be substantial during portions of rush hours, but enough lower volume periods occur to permit clearing of developing lines, preventing excessive backups.
E	0.901−1.000	Poor	Represents the maximum vehicles that intersection approaches can accommodate; may be long lines of waiting vehicles through several signal cycles.
F	>1.000	Failure	Backups from nearby locations or on cross streets may restrict or prevent movement of vehicles out of the intersection approaches. Tremendous delays with continuously increasing queue lengths.

Table 2.1-7 Existing Volume to Capacity (V/C) Analysis – Greater Tehachapi Area Specific Plan

Segment	Roadway Category	Total ADT[1]	Roadway Capacity[2]	V/C	Level of Service	Category
Existing Average Daily Traffic Volumes						
State Route 58 West of Morning Drive	6-lane freeway	57,672	112,500	0.54	A	Excellent
State Route 58 East of Morning Drive	4-lane freeway	32,026	75,000	0.45	A	Excellent
State Route 58 East of Vineland	4-lane freeway	32,026	75,000	0.45	A	Excellent
State Route 58 East of General Beale	4-lane freeway	17,188	75,000	0.24	A	Excellent
State Route 58 East of SR 223	4-lane freeway	19,364	75,000	0.27	A	Excellent
State Route 58 East of Woodford-Tehachapi Road	4-lane freeway	17,688	75,000	0.25	A	Excellent
State Route 58 East of SR 202/ West Tehachapi Boulevard	4-lane freeway	17,079	75,000	0.24	A	Excellent
State Route 58 East of Mill Street Interchange	4-lane freeway	16,793	75,000	0.24	A	Excellent
State Route 58 East of Tehachapi Willow Springs	4-lane freeway	21,483	75,000	0.30	A	Excellent
State Route 58 East of Tehachapi Blvd Intersection	4-lane freeway	22,098	75,000	0.31	A	Excellent

[1]Volumes extrapolated based on information provided in the Kern COG Traffic Model
[2]Daily traffic capacity based on information Metropolitan Bakersfield General Plan Update EIR

Table 2.1-8 Existing Volume to Capacity (V/C) Analysis – City of Tehachapi

Segment	Roadway Category	Total ADT[1]	Roadway Capacity[2]	V/C	Level of Service	Category
Existing Average Daily Traffic Volumes						
Green Street North of Railroad Track	Minor arterial	5,038	12,000	0.42	A	Excellent
Hayes Street North of Railroad Track	Minor arterial	830	12,000	0.07	A	Excellent
Dennison Street North of Railroad Track	Major arterial	1,797	15,000	0.12	A	Excellent
Dennison Street South of Railroad Track	Major arterial	2,803	15,000	0.19	A	Excellent
East Tehachapi Boulevard North of Railroad Track	Major arterial	912	15,000	0.06	A	Excellent

[1]NDS Count Data, 2013
[2]City of Tehachapi Circulation Element based on Wal-Mart EIR and LLG Traffic Study

Table 2.1-9 Existing Volume to Capacity (V/C) Ratio – Metropolitan Bakersfield General Plan

Segment	Roadway Category	Total ADT[1]	Roadway Capacity[2]	V/C	Level of Service	Category
Existing Average Daily Traffic Volumes						
Morning Drive (SR 184) North of Railroad Track	4-lane arterial	13,059	40,000	0.33	B	Excellent
Comanche Drive North of Railroad Track	2-lane arterial	2,884	20,000	0.14	A	Excellent

[1]NDS Count Data, 2013
[2]Metropolitan Bakersfield General Plan Update EIR, 2002

As shown in the above tables, all of the study roadway segments within the project vicinity are currently operating under excellent conditions.

Rail

Along the Tehachapi Trade Corridor, the railroad alignment is double-tracked except in nine locations. Two at-grade rail crossings occur within the project segments:

- Walong to Marcel Segment: One private grade crossing is identified at this segment - a private road at Mile Post 352.80.
- Cliff Siding Extension: One private grade crossing is identified in this segment - a private road at Mile Post 343.35.

Several additional at-grade rail crossings occur within the Tehachapi Trade Corridor, outside of the project segments:

- Morning Drive
- Vineland Road
- Pepper Drive
- Comanche Drive
- Neumarkle Road - Landfill
- Caliente Bodfish Road
- Bealville Road
- N. Green Street
- Hayes Street
- Dennison Road
- Williamson Road
- Tehachapi Boulevard

Train volume through the Tehachapi Pass is 35 trains per day, the current daily average. These 35 trains carry about 7,985 containers each day. Operations after a line stoppage, or other isolated conditions, could range from a minimum of 22 trains to a maximum of 50 trains. Peaks above the existing 35-train daily average are intermittent due to temporary activities such as track inspection, right-of-way maintenance, and track replacement. Historical train counts show that there were only eight days when trains reached 50 per day in the 11-year analysis period. Because these were isolated incidents, the peaks are atypical and are not used as the baseline for purposes of environmental analysis.

Railroad congestion levels are calculated by using a volume-to-capacity ratio and are assessed in the same manner that roadway level of service is assessed. According to the Association of American Railroads, rail corridors operating at LOS A, B, or C are those operating at or below capacity; train flows are carried with sufficient unused capacity to accommodate maintenance work and recover quickly from incidents such as weather delays, equipment failures, and minor accidents. Corridors operating at LOS D are operating near capacity; heavy train flows are carried with only moderate capacity to accommodate maintenance and recover from incidents. Corridors operating at LOS E are operating at capacity; very heavy train flows are carried at very limited capacity to accommodate maintenance and recover from incidents without substantial service delays. Corridors operating at LOS F are operating above capacity; train flows are unstable, and congestion and service delays are persistent and substantial. The LOS grades and descriptions are shown

in Table 2.1-10 and correspond generally to the LOS grades used in highway system capacity and investment requirements studies.

Table 2.1-10 Volume-to-Capacity Ratios and LOS Grades

LOS Grade	Description		Volume/Capacity Ratio
A	Below Capacity	Low to moderate train flows with capacity to accommodate maintenance and recover from incidents	0.0 to 0.2
B			0.2 to 0.4
C			0.4 to 0.7
D	Near Capacity	Heavy train flow with moderate capacity to accommodate maintenance and recover from incidents	0.7 to 0.8
E	At Capacity	Very heavy train flow with very limited capacity to accommodate maintenance and recover from incidents	0.8 to 1.0
F	Above Capacity	Unstable flows; service breakdown conditions	> 1.00

Source: AAR, 2007

The Tehachapi Trade Corridor is characterized by steep mountain terrain that requires increased track curvature and track grades above 1 percent, factors that limit capacity. Railroad capacity, defined as the available train slots, is currently 50 trains per day. As mentioned before, train volume through the Tehachapi Trade Corridor is an average of 35 trains per day. This indicates that the Tehachapi Trade Corridor is effectively functioning at LOS D. According to the Association of American Railroads' study, the Tehachapi Trade Corridor as a rail corridor is operating at LOS E (at capacity); the Association of American Railroads' study was published in 2007, however, and is based on shipment volumes reported in the 2005 Surface Transportation Board Carload Waybill Sample data. The data from 2005 reflect pre-recession conditions, and average daily train volumes were higher than they are now.

Bikeways

There are no bikeways, bicycle facilities, or pedestrian facilities within the project segments. The project is not covered by networks identified by the Kern Council of Governments Bicycle Facilities Plan, as adopted by and referenced in the Kern County General Plan.

Several bicycle transportation facilities exist within the city however, no facilities interface with the railroad. Many are planned, however, for future development throughout the city, including along Dennison Road, Tehachapi Boulevard, Mill Street and the future extension of Challenger Way. The proposed facility along Dennison Road would interface with the existing railroad. No implementation date has been set in the plan for when the proposed facility would be built.

Environmental Consequences

Future Traffic Conditions

While various roadway upgrades have been identified in the 2014 Preliminary Regional Transportation Plan prepared by the Kern Council of Governments, roadway conditions at project build-out are expected to be about the same as they are now through the project study area, except for the extension of Challenger Way from Vienna Street to Dennison Road within the City of Tehachapi. Once improved, this roadway link would ease circulation to the Dennison and Burnett neighborhoods, both of which are currently inaccessible to emergency responders when trains pass.

As trains continue to become the preferred choice for long-haul freight transport, heavy trucks would be removed from adjacent roadways and higher volumes of rail traffic would occur through the Tehachapi Trade Corridor. The following tables outline future conditions within the project study area.

Table 2.1-11 Future (2015) Traffic Volumes

Intersection	Morning Peak Hour				Afternoon Peak Hour			
	Average		Poorest Movement		Average		Poorest Movement	
	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS
Morning Drive at Mills Street	24.0	C	N/A	N/A	17.6	B	N/A	N/A
Morning Drive at Edison Highway	24.6	C	N/A	N/A	27.5	C	N/A	N/A
Morning Drive at Brundage Lane	20.1	B	N/A	N/A	19.9	B	N/A	N/A
Comanche Drive at Edison Highway	8.5	A	N/A	N/A	8.0	A	N/A	N/A
Comanche Drive at State Route 58 Westbound Ramp	3.8	A	9.8	A	3.8	A	11.1	B
Green Street at H Street	6.0	A	11.3	A	7.1	A	13.7	B
Green Street at Tehachapi Blvd	9.1	A	13.0	B	13.8	B	20.8	C
Hayes Street at Tehachapi Blvd	2.7	A	11.0	B	2.5	A	13.7	B
Dennison Road at Tehachapi Blvd	8.6	A	N/A	N/A	9.9	A	N/A	N/A

Delay based on seconds per vehicle average.
N/A= Not applicable. Poorest Movement does not apply for four-way stop and intersections with signals.

Table 2.1-12 Future (2015) Volume to Capacity (V/C) Analysis – SR 58

Segment	Roadway Category	Total ADT[1]	Roadway Capacity[2]	V/C	Level of Service	Category
Existing Average Daily Traffic Volumes						
State Route 58 West of Morning Drive	6-lane freeway	64,022	112,500	0.57	A	Excellent
State Route 58 East of Morning Drive	4-lane freeway	36,002	75,000	0.48	A	Excellent
State Route 58 East of Vineland	4-lane freeway	36,002	75,000	0.48	A	Excellent
State Route 58 East of General Beale	4-lane freeway	19,790	75,000	0.26	A	Excellent
State Route 58 East of State Route 223	4-lane freeway	22,167	75,000	0.30	A	Excellent
State Route 58 East of Woodford-Tehachapi Road	4-lane freeway	20,336	75,000	0.27	A	Excellent
State Route 58 East of SR 202/ West Tehachapi Blvd	4-lane freeway	19,671	75,000	0.26	A	Excellent
State Route 58 East of Mill Street Interchange	4-lane freeway	19,358	75,000	0.26	A	Excellent
State Route 58 East of Tehachapi Willow Springs	4-lane freeway	24,483	75,000	0.33	A	Excellent
State Route 58 East of Tehachapi Blvd Intersection	4-lane freeway	25,154	75,000	0.34	A	Excellent

[1]Volumes extrapolated based on information provided in the Kern COG Traffic Model
[2]Daily traffic capacity based on information in the Metropolitan Bakersfield General Plan Update EIR

Table 2.1-13 Future (2015) Volume to Capacity (V/C) Analysis – City of Tehachapi

Segment	Roadway Category	Total ADT[1]	Roadway Capacity[2]	V/C	Level of Service	Category
Existing Average Daily Traffic Volumes						
Green Street North of Railroad Track	Minor arterial	5,240	12,000	0.44	A	Excellent
Hayes Street North of Railroad Track	Minor arterial	863	12,000	0.07	A	Excellent
Dennison Street North of Railroad Track	Major arterial	1,869	15,000	0.12	A	Excellent
Dennison Street South of Railroad Track	Major arterial	2,915	15,000	0.19	A	Excellent
East Tehachapi Blvd North of Railroad Track	Major arterial	948	15,000	0.06	A	Excellent

[1]NDS Count Data, 2013
[2]City of Tehachapi Circulation Element based on Wal-Mart EIR and LLG Traffic Study

Table 2.1-14 Future (2015) Volume to Capacity (V/C) Ratio – Kern County

Segment	Roadway Category	Total ADT[1]	Roadway Capacity[2]	V/C	Level of Service	Category
Existing Average Daily Traffic Volumes						
Morning Drive (SR 184) north of Railroad Track	4-lane arterial	13,581	40,000	0.34	B	Excellent
Comanche Drive north of Railroad Track	2-lane arterial	2,999	20,000	0.15	A	Excellent

[1]NDS Count Data, 2013
[2]Metropolitan Bakersfield General Plan Update EIR

As shown in the above tables, all project study intersections and roadway segments would be operating at an acceptable level of service. The project would not induce additional vehicular traffic. Based on the results provided in the Traffic Impact Assessment, there would be no changes to traffic and transportation patterns once the project were built.

Build Alternative

Traffic volumes along State Route 58 will grow at a rate of about 2 percent per year. While this growth is expected to occur regardless of whether the project is built, truck volumes associated with freight transport in particular will be increased. While train volume would be roughly the same following completion of the project, the number of longer, 8,000-foot trains would increase. As a result of the increased railroad capacity allowing longer trains, more freight could be transported by rail as opposed to being transported by trucks. Therefore, the project would help to reduce future projected traffic occurring on State Route 58.

Table 2.1-15 shows the change that is expected to occur through the Tehachapi Pass if the project is built.

Table 2.1-15 Future (2015) Change in Volume to Capacity (V/C) Ratio

Roadway Segment	Capacity	Existing Volume	Future Volume (Without Project)[1]	LOS Without Project	Future Volume (With Project)	LOS With Project	Change in V/C Ratio
State Route 58 West of Morning Drive	112,500	57,672	64,022	A	62,462	A	-0.01
State Route 58 East of Morning Drive	75,000	32,026	36,002	A	34,442	A	-0.02
State Route 58 East of Vineland	75,000	32,026	36,002	A	34,442	A	-0.02
State Route 58 East of General Beale	75,000	17,188	19,790	A	18,230	A	-0.02
State Route 58 East of State Route 223	75,000	19,364	22,167	A	20,607	A	-0.02
State Route 58 East of Woodford-Tehachapi Road	75,000	17,688	20,336	A	18,776	A	-0.02
State Route 58 East of State Route 202/ West Tehachapi Blvd	75,000	17,079	19,671	A	18,111	A	-0.02
State Route 58 East of Mill Street Interchange	75,000	16,793	19,358	A	17,798	A	-0.02
State Route 58 East of Tehachapi Willow Springs	75,000	21,483	24,483	A	22,923	A	-0.02
State Route 58 East of Tehachapi Blvd Intersection	75,000	22,098	25,154	A	23,594	A	-0.02

Notes: [1]Considers a worst case peak-train volume scenario.

Construction Impacts

The private grade crossings at Mile Post 343.35 and Mile Post 352.80 and the private road leading to each of the crossings would be temporarily inaccessible during construction. These short, infrequent delays would allow construction materials to be brought into the project site. Construction crews would use State Route 58 to access the site.

Construction is expected to occur over a three-year period, with each segment having a construction phase lasting about a year and being built sequentially; there would be periods of inactivity between construction of the segments. Construction within each priority segment is projected to occur through an orderly progression of independent phases from site

grading and clearing/grubbing, to embankment construction, infrastructure, and track installation. Each phase would require approximately 12 weeks of effort.

Up to three crews could work on the project, using various types of construction equipment, including excavators, dozers, compactors, water trucks, cranes, and graders. Construction workdays are estimated to be 8 hours per day and five days per week. As referenced within Kern County Code, Title 8, construction operations would not occur between 9:00 p.m. and 6:00 a.m. Monday through Friday or at any time between 9:00 p.m. and 8:00 a.m. during weekends and holidays. Construction would not occur at nighttime.

BNSF expects that construction of the 1.38 miles of double-track segments through Tehachapi Pass will be completed by 2015 (expected start date is 2013). Table 2.1-16 shows the estimated crew and equipment needs for construction. The construction work force would vary from 24 persons during grading and embankment construction to 60 persons during ballast and track installation. According to this construction schedule, the new second main track in Tehachapi Pass would be completed and integrated into current operations by 2015.

Table 2.1-16 Estimated Crews and Equipment Needs for Construction

Construction Activity	Crews	Crew Size	Number of Cars[1]	Equipment Needed
Clearing and Grubbing Site Grading	2-3	6-9	27	1 loader excavator, 6 articulated trucks, 1 dozer, 2 water trucks
Embankment Construction	2-3	3-4	12	1 compactor, 1 grader, 1 water truck, 1 dozer
Infrastructure	2-3	13-19	57	4 backhoes, 2 cranes, 2 forklifts, 4 concrete trucks, 1 water truck
Track	2-3	10-12	36	1 speed swing, 1 ballast regulator, 2 tampers, 1 liner, 1 rail heater, 1 anchor applicator
Site Cleanup	2-3	2-3	9	1 pick-up truck, 1 hyrail truck

Source: BNSF, 2011
[1]Assumes worst-case scenario of maximum crew, crew size and one person per car.

Given the low number of construction trips associated with the project, traffic impacts related to project construction are considered to be minor. However, a Traffic Management Plan would be prepared by BNSF to reduce and minimize any potential construction traffic impacts.

Operational Impacts

Train volumes through the Tehachapi Pass are projected to be an average of about 40 trains per day to accommodate freight movement. With the existing railroad configuration, railroad

capacity would be 50 trains. Therefore, on an average day, LOS would be 0.80, which is equivalent to LOS D/E. This LOS reflects heavy to very heavy train flow with moderate to very limited capacity to accommodate maintenance and recover from incidents. Based on the growth that is projected to continue through the Tehachapi Trade Corridor beyond the project horizon year, there is an inherent need for additional single-tracked segments to be double-tracked. However, in the reasonably foreseeable future, neither Caltrans nor BNSF intends to double-track any remaining single-track segments once the project has been completed.

By 2015, freight volumes on a peak day are projected to need the equivalent of 54 trains to maintain operations for the day. With the existing railroad configuration accommodating up to 50 trains per day, any freight in excess of what could be transported on the additional four trains would need to be transported by trucks. A 6,000-foot train can carry 225 containers, and an 8,000-foot train can carry up to 280 containers. Each container is the equivalent of one truck on the road. So, approximately 1,010 additional trucks would be needed to accommodate freight volumes on a peak day; this assumes that the railroad would transport the maximum amount of freight possible and be functioning at maximum capacity, or LOS F.

Level of service for freight would worsen for all available modes of transportation during peak conditions. The relationship between the railroad's LOS would directly affect the LOS along State Route 58. If the railroad decided not to operate at maximum capacity on a peak day, all containers that would have otherwise been on trains would have to be transported by trucks. Therefore, roadway conditions along State Route 58 would worsen.

The Kern Council of Governments and City of Tehachapi have expressed concern about the effect of longer train lengths crossing at-grade intersections at the following locations:

- Morning Drive
- Comanche Drive
- North Green Street
- Dennison Road
- Tehachapi Boulevard
- Hayes Street

The project would allow longer trains to pass through at-grade intersections more frequently. This impact is particularly unique within the City of Tehachapi, which is bisected by the railroad, with no grade separations within the city. When a train passes through, it creates a physical barrier between the northern and southern portions of the city. A grade crossing

analysis of Dennison Road and Green Street in the City of Tehachapi and Morning Drive in unincorporated Kern County was done to determine the existing delay and project future delay that would be experienced at these intersections as a result of daily train passes.

The analysis found that the average daily gate-down time for each train passing would increase from approximately 3:02 minutes to 3:55 minutes, an average increase of 53 seconds. Because the gate-down time would be increased, a higher volume of cars would occur along adjacent roadway segments; the backup of cars could flow into downstream intersections. This condition is called "queue spillback." Queue spillback blocks traffic along the streets, disrupts forward movements, and creates backups at green lights. Queue spillback is common in oversaturated street networks, especially when intersections are closely spaced[4]. An impact would occur if the project would cause vehicles to back up into the next downstream intersection.

A VisSim simulation was done to examine how intersection traffic, particularly vehicle queue, would operate with implementation of the project under 2015 conditions. The Highway Capacity Manual (HCM) has limited capability to simulate and present the resulting vehicle queuing, so VisSim was used in the evaluation and found that the project would not cause queue spillback at adjacent intersections.

An alternative route analysis was done in the City of Tehachapi based on emergency response times provided by the County of Kern Emergency Medical Services. The analysis looked at the effectiveness of emergency responders using an alternative route during a train crossing as opposed to waiting at the at-grade intersection until the train passed. The analysis found that, while it was more effective to use an alternative route in some instances, use of alternative routes do not offer a significant advantage over waiting at an at-grade intersection. The analysis also found that emergency responders would still be able to meet emergency response goals set by County of Kern Emergency Medical Services. Additional details and further analysis are provided in Section 2.1.5, *Utilities/Emergency Services* and in the traffic impact analysis prepared for the project and included in the combined appendices to this report.

Reduced-Segment Alternative

Construction and Operational Impacts

Construction impacts would be similar to the Build Alternative. Construction is expected to take a year, and the equipment and personnel required would be similar to the Build Alternative. Access at one private grade crossing would be temporarily restricted to

[4] Center for Transportation Research, University of Texas at Austin, 2007

accommodate construction of the additional track segment. However, these impacts would be less than significant, and the minimization measures adopted for the Build Alternative would be applicable for this alternative.

As a result of the Reduced-Segment Alternative, up to 220 more containers could be moved on an average day by rail as opposed to using trucks. The expected average displacement would be 330 fewer than the displacement that would occur during the Build Alternative. While roadway conditions and V/C ratio along State Route 58 would be only marginally worse than the Build Alternative, all levels of service would still be considered "excellent." During peak conditions, the Reduced-Segment Alternative would result in a maximum container throughput that is 780 containers fewer than the Build Alternative. This would occur because there would be six fewer 8,000-foot trains per day allowed through the Tehachapi Trade Corridor compared to the Build Alternative, which allows for 12 8,000-foot trains.

Total gate-down time would be less affected if fewer 8,000-foot trains were to pass through at-grade intersections. With the Reduced-Segment Alternative, gate-down time would increase by an average of 29 seconds during a train passing, from 3:02 minutes to 3:31 minutes. Based on the finding of the Alternative Routes Analysis under the Build Alternative, the 29-second increase would also not be considered substantial for purposes of emergency response thresholds and, therefore, would not necessitate the need for roadway improvements.

No-Build Alternative

Construction and Operational Impacts

BNSF growth projections indicate that freight volumes through the Tehachapi Pass will increase by 14 percent from 2012 to 2015, from 7,985 containers to 9,110 containers. Under the No-Build Alternative, rail capacity would not be expanded and trucks would handle the freight movement once the capacity of the existing single track is exhausted. This would result in 1,125 additional trucks on the state highway system. However, the additional trucks that would be needed to accommodate projected rail volumes would not cause any freeway segment to function at an unacceptable level of service.

Avoidance, Minimization, and/or Mitigation Measures

Minimization Measures

While the project would not affect traffic volumes on adjacent roadways, slow-moving and oversized vehicles during project construction would be needed to haul construction materials and/or equipment to and from the project site. These vehicles intermixed with

existing and future traffic along adjacent roadways would not substantially alter the existing flow of traffic. The following measure would help to minimize these potential impacts:

- A Traffic Management Plan would be prepared prior to the start of construction by BNSF to reduce and minimize impacts to private grade crossings and roads leading to the crossings within the affected environment. This plan should also include the following:
- A minimum of one open lane for traffic at two-lane roadways would be maintained if there are no options for detours at roadway crossing work zones.
- BNSF and its contractor would coordinate with Caltrans and the County of Kern Public Works Department to implement a public awareness campaign advising motorists and local residents on the dates of construction and details of potential road closures.
- BNSF and its contractor would coordinate with the County of Kern Roads Department to provide advance warning signs in construction zones to mitigate conflicts between construction activities and vehicular traffic.
- BNSF and its contractor would provide flagmen to direct traffic at construction areas next to public roadways to mitigate conflicts between construction activities and vehicular traffic, if warranted.

2.1.7 Visual/Aesthetics

Regulatory Setting

The California Environmental Quality Act establishes that it is the policy of the state to take all action necessary to provide the people of the state "with…enjoyment of *aesthetic*, natural, scenic and historic environmental qualities" (California Public Resources Code Section 21001[b]).

Affected Environment

A visual impact analysis was prepared for the project and is provided in the Combined Technical Reports document associated with this environmental impact report. See the Aesthetics and Visual Resources Impact Assessment.

The Greater Tehachapi region sits in eastern Kern County along State Route 58 between the San Joaquin Valley and the Mojave Desert. The Greater Tehachapi region is known for its four seasons, rural communities, Tehachapi Loop, electricity-generating wind turbines, proximity to Edwards Air Force Base, and gliding. The Greater Tehachapi region generally refers to the City of Tehachapi and the surrounding rural communities of Alpine Forest,

Golden Hills, Stallion Springs, Bear Valley Springs, Cummings Valley, Cummings Ranch, Keene, Cameron Canyon, Sand Canyon, Mendiburu Springs, Monolith, Old Town, Old West Ranch, and Brite Valley. The project is not within or near any designated scenic vistas, or within view of any state-designated scenic highways or locally recognized scenic roads or corridors. The project is in the Tehachapi Trade Corridor rail alignment and goes through the Tehachapi Mountains.

The existing visual condition is the baseline for assessing visual impacts and covers the following public views:

- Views that are readily available to the public
- Views for which there are indications the public would be concerned if they were to be adversely affected
- Views within which a proposed action would be substantially visible

A brief summary of the critical public views is provided below. For more details, refer to the Aesthetics and Visual Resources Impact Assessment document included in the Combined Technical Reports document.

Critical Public Views

Track expansions from the project would be visible to the public only along limited areas of the Walong to Marcel segment. For this 1.01-mile segment, the most visible part of the double-track alignment would be where the new track bypasses Tunnel 10 through a graded slot about 40 to 50 feet north of the existing track centerline. The bypass would be within view from a turnout along Tehachapi-Woodford Road about 1,200 feet away. The Tehachapi Loop is on the far side of the hill through which Tunnel 10 passes. Portions of the new double track on both sides of the tunnel would be visible from two more viewing positions near Tunnel 10.

Several turnouts along Woodford-Tehachapi Road have public monuments that explain the engineering that went into creating the Tehachapi Loop. Given that the Tehachapi Loop area is an important attraction for sightseers and rail fans, views from Woodford-Tehachapi Road, its several turnouts, and the over-tunnel positions are deemed to be highly sensitive. Because certain project features would be in the foreground of views from these three viewing positions, they are treated as critical public views.

There were no public views identified for the Cliff Siding Extension, and further analysis along this extension is not warranted.

Existing Visual Conditions within Critical Public Views

Visual Character

Public viewing positions for this assessment are along the Walong to Marcel segment. The landscape setting for the segment features rural lands within a larger, natural-appearing landscape dominated by the Tehachapi Mountains. Oak woodlands, along higher elevations of the segment, are considered an important natural and visual resource for the region.

Several types of cultural features are inherent to this character type, including the BNSF/Union Pacific Railroad built in the late 1800s and the railroad towns that sprang up along the rail line during its early years. The railroads are the most memorable features within the Tehachapi Pass area. Features associated with the development of the railroad are treated as inherent to the landscape and include tunnels, cut and fill slopes, sidings, as well as the towns.

Neither of these segments has visibly inconsistent alterations of landforms (excessive grading and filling). Features in view from the identified critical public views are similar and consistent with the character of the region. There is readily available access to unobstructed views of the Tehachapi Loop and the many parts of the Walong to Marcel and Caliente to Bealville segments.

Light and Glare

The set of lights on the front of the train locomotives is a source of potential light and glare. Locomotives typically use ditch and crossing lights to provide focused lighting along rail segments that are in front of the train, which permits the train engineer to see a specified distance ahead to operate the locomotive in a safe manner. Glare would occur on any sensitive receptor in line with the direction of the rail. Given that trains have been an expected part of the landscape for more than 130 years, the occasional sweep of lights across the Caliente residences from passing locomotives is an inherent part of living in the project area. The daytime operation of locomotives, which operate with all sets of lights on all the time, do not produce glare during daylight hours.

Environmental Consequences

Build Alternative

Construction Impacts

Construction of the additional track would require cutting and filling slopes and adding or expanding existing culverts. No tunnels would be removed as part of this project. Visual impacts during construction would include the temporary presence and movement of a workforce and heavy equipment, as well as lay down areas for supplies and materials. Project

construction would occur solely during daylight hours. Therefore, there would be no potential for nighttime light and glare impacts due to construction activities.

Construction would occur in two separate phases; construction impacts would be limited to the area of one specific segment at a time, per the project construction schedule. The Cliff Siding Extension is not visible to the public, so no visual impacts from construction would occur. During construction, the project would not diminish the extent to which any scenic vista would be visible to the public, but would temporarily interfere with public access to some currently available viewing positions. Clearing, grubbing, and excavation for the graded slot for the tunnel bypass for the double track would result in the loss of a substantial number of oak trees that now stand on the slopes on the north side of the proposed double track. Mitigation measure VIS-1 addresses this loss, and the trees would be replaced through appropriate re-vegetation, consistent with local regulations and State Senate Concurrent Resolution No. 17 (also see Section 2.3, *Biological Environment*).

Project construction may result in temporary blocking of visual access to Tunnel 10 because of the considerable grading required to create the bypass around it. The intensity of activity that can be expected there, which would not occur at locations where cut and fill slopes are located, would be less.

Construction of the railroad and its operation are part of the history of the Tehachapi area. Construction activities improving the rail line are consistent with the character of the area. In addition, the potentially affected view of Tunnel 10 is not unique. Tunnel 9 is also readily seen from the road from a number of turnouts along Woodford-Tehachapi Road, as analyzed in the Aesthetics and Visual Resources Impact Assessment document.

Operational Impacts

Figure 2.1-6 shows existing conditions of the project near Tunnel 10, plus a visual simulation of the proposed bypass around Tunnel 10 through a graded slot about 40 to 50 feet north of the existing track centerline. There would be no replanting of the cut slopes for the graded notch, and the simulation shows the long-term visual effects during the operational phase of the project. Disturbed slopes along the new double track in the foreground, however, would be reseeded with native grasses.

The net effect of building the project would continue to be rated as Visual Modification Class 1, consistent with the character of the existing rail line in the Tehachapi Pass area. The project would maintain the current scale, pattern, organization, and composition of the landscape, and there would be no adverse impact to visual conditions.

Existing

Proposed

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project	March 2013	Figure 2.1-6
Tunnel 10 Bypass and Simulations	Caltrans	

Sources: URS Corporation - November 2009

Reduced-Segment Alternative

As stated in the Affected Environment subsection, the Walong to Marcel segment features the only critical public viewing areas. The changes that would occur under the Reduced-Segment Alternative would be the same as the Build Alternative.

No-Build Alternative

Under the No-Build Alternative, the project would not be built and the existing conditions would remain unchanged. Potential impacts related to construction and operation to existing visual and aesthetic resources, as well as cumulative impacts, would not occur as a result of the No-Build Alternative. However, the average number of trains passing through the region would continue to increase, which would increase light and glare impacts, similar to the Build Alternative.

Avoidance, Minimization, and/or Mitigation Measures

The following mitigation measure has been incorporated to minimize potential risks from visual impacts:

- Oak tree mitigation will involve the planting of new oak trees offsite at a ratio of 3:1 for acres of impact. These restoration activities will be detailed in the Native Vegetation Restoration and Monitoring Plan. The Native Vegetation Restoration and Monitoring Plan will include: grading plans to return temporarily-disturbed areas to pre-disturbance topography; native plant palettes including seed mixes and container planting for each habitat type impacted; a planting plan and schedule; a monitoring plan and schedule; a maintenance plan and schedule; and performance criteria for determining successful implementation of the plan. The restoration and monitoring plan will be implemented by BNSF/UPRR after construction activities have been completed. The final plan will be prepared and submitted prior to construction to the appropriate resource agency for approval.

2.1.8 Cultural Resources

Regulatory Setting

The term “cultural resources” as used in this document refers to all historical and archaeological resources, regardless of significance. Laws and regulations dealing with cultural resources are present in the following discussion.

Cultural resources that are historical resources are considered in the context of California Environmental Quality Act compliance. The California Environmental Quality Act defines an historical resource as “a resource listed in, or determined to be eligible for listing in, the California Register of Historical Resources” (Public Resources Code Section 21084.1).

Section 15064.5 of the California Environmental Quality Act Guidelines (Public Resources Code Section 15064.5 (a)(3) (A-D)) outlines the historical resource criteria for evaluation. It is the lead agency's responsibility to determine if a cultural resource is an historical resource. Additionally, any resource determined eligible for the National Register of Historic Places is an historical resource for the purposes of the California Environmental Quality Act.

Section 21084.1 of the California Environmental Quality Act states that any project "that may cause a substantial adverse change in the significance of an historical resource [includes archaeological sites and structures, among other things] is a project that may have a substantial effect on the environment and require an Environmental Impact Report." "Physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired" is considered a substantial adverse change (Public Resources Code Section 15064.5 (b)).

Public Resources Code Section 15064.5 (b)(4) states that "a lead agency shall identify potentially feasible measures to mitigate significant adverse changes in the significance of an historical resource."

Further, the California Environmental Quality Act Guidelines state that the "lead agency shall ensure that any adopted measures to mitigate or avoid significant adverse changes are fully enforceable through permit conditions, agreements, or other measures." Public Resources Code Section 15126.4 outlines appropriate mitigation for historical resources.

Affected Environment

A Historical Resource Compliance Report was completed for the project in February 2012 (2012 HRCR), and a Supplemental Historical Resource Compliance Report was completed for the project in June 2013 (2013 S-HRCR). Standard sources of information on cultural resources were consulted for the project, including the following: the National Register of Historic Places, the California Register of Historical Resources, the State Office of Historic Preservation, the California Historical Landmarks, the California Points of Historical Interest, the California Inventory of Historic Resources, the State Historic Resources Commission, and site records and reports filed at the Southern San Joaquin Valley Archeological Information Center at California State University, Bakersfield through the California Historical Resources Information System.

In addition, local historical research was done at the California Railroad Museum, Tehachapi Museum, California Department of Parks and Recreation, Kern County Library, Kern County Museum, University of California, San Diego Geisel Library, San Diego Public Library, and

Kern County Resource Management Agency Planning Department. Other sources included information available from the Cesar Chavez Foundation, National Park Service West Region Cultural Resources Program, National Park Service Park Planning and Environmental Compliance Program, and Caltrans Division of Environmental Analysis, Cultural Studies Office–Built Environment Preservations Services Branch.

The project area limits were established in consultation with Jeanne Binning, Caltrans District 6 Branch Chief, David Lanner, Caltrans District 6 Associate Environmental Planner (Archaeology), Philip Vallejo, Caltrans District 6 Associate Environmental Planner (Architectural History), and Marc A. Canas, M.C.S.E. (Patterson and Associates), from January 2013 through March 2013. The project area limits were delineated based on guidance in Caltrans' Standard Environmental Reference Manual, Volume 2, Chapters 4 through 7.

The project area limits were established to include all properties that may be potentially affected by the project. The project area limits for the archaeological and architectural history studies included the maximum limits of construction, ground disturbance, and project improvements, which included the railroad right-of-ways, construction easement areas, property take areas, access roads, and staging areas specifically within the Walong-to-Marcel and Cliff Siding Extension segments, extending from mile posts 352.07 to 353.08 and 343.27 to 343.64, respectively. In addition, for the architectural history studies, the project area limits were expanded to include properties that could be indirectly affected by the project. As a result, the boundaries of the Nuestra Señora Reina de La Paz geographic historic district at 29700 Woodford-Tehachapi Road in Keene and the adjacent railroad were incorporated into the project area limits.

The 2012 Historical Resource Compliance Report, which included a geographically larger project area limits to account for the proposal to double-track five segments, identified six cultural resources, including two built environment historic-period properties and four prehistoric cultural resources as follows:

- Nuestra Señora Reina de La Paz geographic historic district, 29700 Woodford-Tehachapi Road, Keene
- Portion of the Southern Pacific-Santa Fe Railroad
- CA-KER-7445/P-15-013264
- CA-KER-7446/P-15-013265
- CA-KER-7447/P-15-013266

- CA-KER-7448/P-15-013267

As part of the 2013 Supplemental Historical Resource Compliance Report, reduced project area limits were established to account for double-tracking at only two locations. This resulted in only the Nuestra Señora Reina de La Paz geographic historic district and a portion of the Southern Pacific-Santa Fe Railroad remaining in the project area limits. The four identified prehistoric cultural resources are not included in the revised project area limits because there is no longer any potential for the proposed project to affect these resources. The project area limits are defined in Section 2 of the 2013 Supplemental Historical Resource Compliance Report. Maps of the project area limits, showing both the archaeological project area limits and architectural history project area limits, are included in the Evaluation of Impacts Report contained in Appendix D of this environmental impact report.

Nuestra Señora Reina de La Paz

During completion of the 2012 Historical Resource Compliance Report, the Nuestra Señora Reina de La Paz geographic historic district was approved by the Keeper of the Register for listing to the National Register of Historic Places with a period of significance from 1970 to 1984. Since then, on October 8, 2012, the Nuestra Señora Reina de La Paz property was also designated as a National Historic Landmark by Secretary of the Interior Ken Salazar. The boundaries, period of significance, and contributing resources to the National Historic Landmark correspond with those of the National Register of Historic Places-listed Nuestra Señora Reina de La Paz geographic historic district.

In addition, on October 8, 2012, the 10.5-acre National Chavez Center, which includes the Visitor Center, Cesar Chavez's home, and the Memorial Garden (including Cesar Chavez's burial site), was established as a national monument by presidential proclamation within a portion of the geographic historic district. The proclamation established national significance based on the center's association with Cesar Chavez and the farm worker movement that he led. As part of the National Chavez Center, the Visitor Center, Cesar Chavez's home, and Memorial Garden are considered objects of historic interest, although they are not contributing resources to the National Register of Historic Places and National Historic Landmark designations.

The geographic historic district was listed in the National Register of Historic Places under Criterion A (Events) for its association with the development of the United Farm Workers labor movement and Criterion B (Persons) for its association with the productive life of Cesar Chavez, an important figure in the history of the United States. The geographic historic district is also significant under Criteria Consideration G (Properties that have Achieved Significance in the Last Fifty Years) because it is exceptionally important within the context

of the farm worker labor movement and the life work of labor leader Cesar Chavez. The geographic historic district includes 24 contributing resources and four non-contributing resources, encompassing 187 acres in Keene.

Environmental Consequences

Build Alternative

The Nuestra Señora Reina de La Paz geographic historic district is the only historical resource within the project area limits. While the project would not directly affect the geographic historic district because no construction activities are proposed within or near the boundaries of the geographic historic district, it was included to assess the potential for indirect effects caused by the project.

Construction and Operational Impacts

The project would double-track the Walong to Marcel and Cliff Siding Extension segments, extending from mile posts 352.07 to 353.08 and 343.27 to 343.64, respectively. There would be no construction activities of any type within the Rowen to Woodford segment, extending from mile posts 346.40 to 348.15, where the geographic historic district is located. The closest construction activities to the geographic historic district are approximately 3.13 miles to the west-northwest, and there is no visual relationship or shared view between the proposed double-track segments and the Rowen to Woodford segment. The only change that would occur in the area near the geographic historic district would be a slight increase in the length of the trains that pass each day. It is estimated that the daily railroad maximum capacity would increase from 50 trains per day to up to 56 trains per day as a result of the Build Alternative on a peak day. In addition, the number of 8,000-foot trains that pass would increase from 2 to 10 trains.

It is important to note that throughout the geographic historic district's period of significance, the level of freight and rail traffic has remained relatively consistent and has not affected the historic integrity of the district. Train volumes will continue to increase over time. This condition would occur regardless of whether the project is built. However, once the project were built, the frequency of 8,000-foot trains would increase. Assuming a perfect distribution of trains traveling through the corridor, a train presently passes through, on average, once every 41 minutes. With the project, trains would pass through, on average, every 36 minutes.

Overall, the project would not destroy the historic or visual relationship between the Nuestra Señora Reina de La Paz geographic historic district and its landscape or setting. The project would not radically change or remove any feature associated with the geographic historic district and would not create a false sense of history or disrupt the historical appearance of

the area. Because there would be no improvements near the district, the project would not introduce non-compatible visual out-of-scale elements that contrast with the size, design, and character of the historical resource's contributing properties.

The project area limits are known to be an area of high archaeological and anthropological sensitivity, although no resources are known to be within construction areas. Potential construction impacts to cultural resources during activities such as excavation and grading would not be substantial.

Reduced-Segment Alternative

The Reduced-Segment Alternative, like the Build Alternative, would not directly or indirectly affect the significance of the Nuestra Señora Reina de La Paz geographic historic district or other historical resources within the archaeological or architectural history project area limits. The project would not cause physical demolition, destruction, relocation, or direct alteration to the geographic historic district, and the project would not alter the geographic historic district's immediate surroundings, setting, feeling, or ability to convey its historic integrity. Therefore, the Reduced-Segment Alternative would have no impact to historical resources.

No-Build Alternative

Under the No-Build Alternative, construction would not occur and the existing conditions would remain unchanged. Potential impacts related to cultural resources would not occur as a result of the No-Build Alternative.

Avoidance, Minimization, and/or Mitigation Measures

Minimization Measures

Caltrans and BNSF shall ensure that impacts to cultural resources related to the unanticipated discovery of human remains are reduced to less than significant levels by ensuring that, in the event that human remains are encountered, construction in the area of the find shall cease, and the remains will stay *in situ* pending definition of an appropriate plan. State Health and Safety Code Section 7050.5 states that further disturbances and activities shall cease in any area or nearby area suspected to overlie remains, and the Kern County Coroner shall be contacted. Pursuant to Public Resources Code Section 5097.98, in the event the remains are Native American in origin, the Native American Heritage Commission will be contacted to determine necessary procedures for protection and preservation of the remains, including identifying the Most Likely Descendent or reburial, as provided in the California Environmental Quality Act Guidelines, Section 15064.5(e), "CEQA and Archaeological Resources," California Environmental Quality Act Technical Advisory Series.

If additional cultural materials are discovered during construction, all earth-moving activity within and around the immediate discovery area will be diverted until a qualified archaeologist can assess the nature and significance of the find.

2.2 Physical Environment

2.2.1 Hydrology and Floodplain

Affected Environment

The environmental setting includes the local drainage and regional hydrology. Detailed information is available in the Hydrology, Hydraulics, and Water Quality Technical Report prepared for the project and included with the Combined Technical Reports document of this environmental impact report.

The project is made up of two segments along the railway alignment. The project study area is the proposed physical ground disturbance footprint, which sits in the southern portion of the Regional Water Quality Control Board's Central Valley Region Basin Plan, within the Middle Kern-Upper Tehachapi-Grapevine Watershed (see Figure 2.2-1, Central Valley Regional Watersheds). The Middle Kern-Upper Tehachapi-Grapevine Watershed encompasses 1,310 square miles and contains the two segments of the study area, which are within the Grapevine Hydrologic Unit. The study area is within the jurisdictions of the Regional Water Quality Control Board and the California Department of Fish and Wildlife.

The local drainage components of the project's segments involve seven culverts and water crossings that convey storm flows into watercourses that are a tributary to the Tehachapi Creek. The existing drainage system defines the pre-project hydrology and serves as the baseline condition used for comparative analysis of potential impacts. Of the seven culverts, four have been located and documented, and three historically documented culverts have not been found or located. Studies show that these drainage facilities consist of concrete box culverts, corrugated metal pipe, and concrete pipe. Upstream watersheds that drain into the culverts are assumed to remain as an undeveloped land use based on the current Resource Management Land Use Designations shown on the Kern County General Plan Map. In addition, there are no levees, dams, or other large water detention facilities upstream from the culverts in the study area, which could affect drainage capacity requirements.

The Federal Emergency Management Agency 100-year floodplain, shown in Figures 2.2-2 and 2.2-3, courses Tehachapi Creek within the study area. The 100-year floodplain generally increases in size within the western, down-slope portion of the study area. However, the Walong to Marcel and Cliff Siding Extension segments occur outside the 100-year floodplain

and would not place housing or other structures within the floodplain. In addition, there are no culverts or bridge locations from the project that are within the Federal Emergency Management Agency Flood Zone Designations. The Hydrology, Hydraulics, and Water Quality Technical Report, as well as the Geologic Hazards and Soils Technical Report prepared for the project, note that the soil within the study area would not be susceptible to heavy mudflows.

Environmental Consequences

Build Alternative

Construction Impact

Potential impacts from the Build Alternative would occur mainly during construction. Grading activities would include embankment fills and slope cuts. Drainage flows would be affected mainly during grading. During a heavy rain, the project could be affected if rain occurs during the grading activities. Minimization measures have been incorporated to address this issue. However, project activity would not result in any major changes to the drainage pattern geometry nor would it alter the water surface elevation level or change the floodplain boundary of the study area. Construction of the project would not result in substantial impacts.

Operational Impact

The project would build railroad tracks parallel to existing tracks. As a result, construction of the new track would require widening the track right-of-way area and the supporting foundation, and may require extending existing culverts. The Hydrology, Hydraulics, and Water Quality Technical Report considered two potential scenarios (see below) that could occur at each culvert location. The final grading plan would ultimately determine which scenario would occur at each culvert location.

Scenario 1 assumes that a culvert section would need to be extended to accommodate the railroad right-of-way. In this case, the slope of the new culvert section may vary to accommodate the new embankment grading limits. A potential increase in culvert discharge velocity may also occur due to the change in culvert profile grade. However, appropriate velocity and scour design features such as riprap, concrete block baffle systems, and/or stilling basins would be incorporated into the final design and would restore the culvert's discharge characteristics to pre-project condition.

SHAFTER

BAKERSFIELD

ARVIN

SOUTH VALLEY FLOOR

KERN RIVER

GRAPEVINE

FREMONT

TEHACHAPI

CALIFORNIA CITY

ANTELOPE

Cliff Siding Extension

Walong to Marcel

5

99

58

14

166

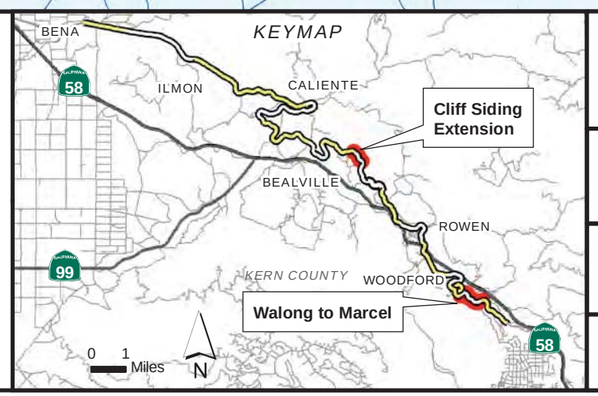
Sources: USGS National Hydrography Dataset

Legend

- Tehachapi Corridor
- Proposed Double Track Extension
- Hydrolic Unit
- Hydrologic Sub-Area

0 5 10
Miles

KEYMAP



BNSF/UPFF Mojave Subdivision Tehachapi Rail Improvement Project

Central Valley Regional Watersheds

March 2013

Figure 2.2-1

Caltrans

I:\BNSF_Tehachapi_Rail_Alignment\Apr\Natural_Resources\EIR_EIS\Figure_2.2-1_Regional_Watershed_Map_20130313.mxd

THIS AREA SHOWN AT A
SCALE OF 1" = 500'
ON MAP NUMBER 06029C2386

JOINS PANEL 2425

39°07'000m N
39°06'000m N
39°05'000m N
39°04'000m N
39°03'000m N
39°02'000m N
35°15'00.00"
118°37'30.00"

25 30 29 31 32 35 36 1 6 5 2 11 12 7 8

Sycamore Canyon Creek
Montgomery Canyon Creek
Clear Creek
Tehachapi Creek
Deer Canyon Creek
Orejano Canyon Creek

FU3774
FU0057
FU0058
FU0061
FU0063

ZONE A
ZONE X
CLIFF
RAILROAD

T. 30 S.
T. 31 S.
R. 31 E.
R. 32 E.

JOINS PANEL 2370
JOINS PANEL 2825

MAP SCALE 1" = 2000'
1000 0 2000 4000 FEET
0 0 600 1200 METERS

Legend

- Existing Culvert Crossing
- Project Segment
- Existing Single Track Not in Project
- Existing Double Track Not in Project

600 0 600 1200

NFIP

PANEL 2400E

FIRM

FLOOD INSURANCE RATE MAP

KERN COUNTY,
CALIFORNIA
AND INCORPORATED AREAS

PANEL 2400 OF 4125
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
KERN COUNTY	060075	2400	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

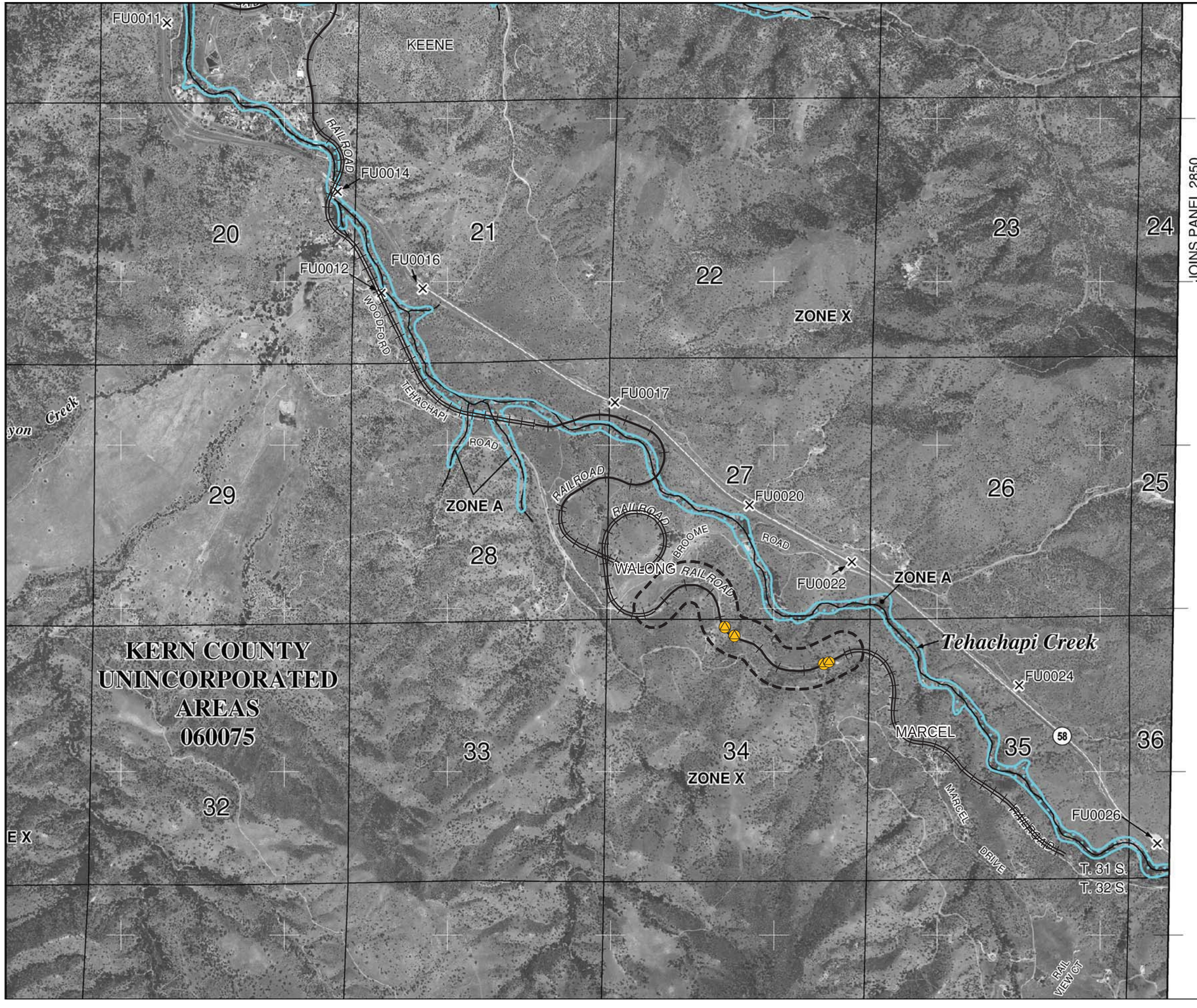
MAP NUMBER
06029C2400E

EFFECTIVE DATE
SEPTEMBER 26, 2008

Federal Emergency Management Agency

NATIONAL FLOOD INSURANCE PROGRAM

Figure 2.2-2
FEMA 100 Year Floodplain
Cliff Siding Extension



MAP SCALE 1" = 2000'

1000 0 2000 4000 FEET

Legend

- Existing Culvert Crossing
- Project Segment
- Existing Single Track Not in Project
- Existing Double Track Not in Project

NFIP

NATIONAL FLOOD INSURANCE PROGRAM

PANEL 2825E

FIRM

FLOOD INSURANCE RATE MAP

KERN COUNTY, CALIFORNIA

AND INCORPORATED AREAS

PANEL 2825 OF 4125

(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
KERN COUNTY	060075	2825	E

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
06029C2825E

EFFECTIVE DATE
SEPTEMBER 26, 2008

Federal Emergency Management Agency

Figure 2.2-3

FEMA 100 Year Floodplain
Walong to Marcel

Scenario 2 assumes that the new embankment grading and fill daylights fall short of the existing toe-of-slope of the existing culvert. In this case, the existing culvert system may not require any extension, but replacement may be necessary to address deterioration of the existing facility. Depending on the results of the final geotechnical investigation, the engineering parameters may allow for construction of steeper embankment fills or use of retaining walls to maintain new embankment fills behind the limit of the end of an existing culvert.

Regardless of which scenario is carried out, the drainage culverts would convey storm flows under the railroad facilities and use the same horizontal alignment as the pre-project conditions. The Hydrology, Hydraulics, and Water Quality Technical Report notes that these improvements do not have the potential to change the overall drainage basin acreage, topographic relief, soil conditions, vegetative cover, land-use, and/or rainfall, which typically influence erosion rates, the transport of eroded material, or the drainage capacity. Sedimentation and drainage patterns would remain the same from the pre- to the post-project condition. No impacts to the hydrological capacity or floodplain within the study area would occur.

Reduced-Segment Alternative

Under the Reduced-Segment Alternative, no culverts would be extended in the Cliff Siding Extension. However, in general, hydrologic conditions under the Reduced-Segment Alternative would remain the same as under the Build Alternative, and the recommended minimization measure for the Build Alternative would also apply to this alternative.

No-Build Alternative

Under the No-Build Alternative, the project would not be built and the existing conditions would remain unchanged. There would be no construction, operational, or cumulative impacts from the No-Build Alternative.

Avoidance, Minimization, and/or Mitigation Measures

Minimization Measures

All impacts in this issue area would be less than significant prior to implementation of avoidance, minimization, and/or mitigation measures. However, to minimize impacts from the project, BNSF would implement the following:

- During construction, work within or over the floodways would be scheduled by BNSF to occur during the non-rainy season. Minimal impacts to sediment buildup may occur during construction of the project, however, energy dissipation devices and best management practices would minimize sedimentation buildup and erosion.

2.2.2 Water Quality

Regulatory Setting

Federal

Clean Water Act

In 1972, Congress amended the Federal Water Pollution Control Act, making the addition of pollutants to the waters of the United States (waters of the U.S.) from any point source[5] unlawful unless the discharge is in compliance with a National Pollutant Discharge Elimination System (NPDES) permit. This act and its amendments are known today as the Clean Water Act. Congress has amended the act several times. In the 1987 amendments, Congress directed dischargers of storm water from municipal and industrial/construction point sources to comply with the National Pollutant Discharge Elimination System permit scheme. The following are important Clean Water Act sections:

- Sections 303 and 304 require states to issue water quality standards, criteria, and guidelines.
- Section 401 requires an applicant for a federal license or permit to conduct any activity that may result in a discharge to waters of the U.S. to obtain certification from the state that the discharge will comply with other provisions of the act. This is most frequently required in tandem with a Section 404 permit request (see below).
- Section 402 establishes the National Pollutant Discharge Elimination System, a permitting system for the discharges (except for dredge or fill material) of any pollutant into waters of the U.S. Regional Water Quality Control Boards administer this permitting program in California. Section 402(p) requires permits for discharges of storm water from industrial/construction and municipal separate storm sewer systems (MS4s).
- Section 404 establishes a permit program for the discharge of dredge or fill material into waters of the U.S. This permit program is administered by the U.S. Army Corps of Engineers.

The goal of the Clean Water Act is "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters."

The U.S. Army Corps of Engineers issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in

[5] A point source is any discrete conveyance such as a pipe or a human-made ditch.

nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of the U.S. Army Corps of Engineers' Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the U.S. Army Corps of Engineers decision to approve is based on compliance with United States Environmental Protection Agency's (U.S. EPA) Section 404 (b)(1) Guidelines (U.S. EPA Code of Federal Regulations 40 Part 230), and whether the permit approval is in the public interest. The Section 404(b)(1) Guidelines were developed by the U.S. EPA in conjunction with the U.S. Army Corps of Engineers and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The guidelines state that the U.S. Army Corps of Engineers may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S. and not have any other significant adverse environmental consequences. According to the guidelines, documentation is needed that a sequence of avoidance, minimization, and compensation measures has been followed, in that order. The guidelines also restrict permitting activities that violate water quality or toxic effluent[6] standards, jeopardize the continued existence of listed species, violate marine sanctuary protections, or cause "significant degradation" to waters of the U.S. In addition, every permit from the U.S. Army Corps of Engineers, even if not subject to the Section 404(b)(1) Guidelines, must meet general requirements. See 33 Code of Federal Regulations 320.4. A discussion of the least environmentally damaging practicable alternative determination, if any, for the document is included in the Wetlands and Other Waters section.

State

Porter-Cologne Water Quality Control Act (California Water Code)

California's Porter-Cologne Act, enacted in 1969, provides the legal basis for water quality regulation within California. This act requires a "Report of Waste Discharge" for any discharge of waste (liquid, solid, or gaseous) to land or surface waters that may impair beneficial uses for surface and/or groundwater of the state. It predates the Clean Water Act and regulates discharges to waters of the state. Waters of the State include more than just waters of the U.S., like groundwater and surface waters not considered waters of the U.S. Additionally, it prohibits discharges of "waste" as defined and this definition is broader than

[6] The U.S. EPA defines "effluent" as "wastewater, treated or untreated, that flows out of a treatment plant, sewer, or industrial outfall."

the Clean Water Act definition of "pollutant." Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements (WDRs) and may be required even when the discharge is already permitted or exempt under the Clean Water Act.

The State Water Resources Control Board and Regional Water Quality Control Boards are responsible for establishing the water quality standards (objectives and beneficial uses) required by the Clean Water Act, and regulating discharges to ensure compliance with the water quality standards. Details about water quality standards in a project area are included in the applicable Regional Water Quality Control Board Basin Plan. In California, Regional Boards designate beneficial uses for all water body segments, and then set criteria necessary to protect these uses. As a result, the water quality standards developed for particular water segments are based on the designated use and vary depending on that use. In addition, the State Water Resources Control Board identifies waters failing to meet standards for specific pollutants. These waters are then state-listed in accordance with Clean Water Act Section 303(d). If a state determines that waters are impaired for one or more constituents and the standards cannot be met through point source or non-point source controls (National Pollutant Discharge Elimination System permits or Waste Discharge Requirements), the Clean Water Act requires the establishment of Total Maximum Daily Loads (TMDL). Total Maximum Daily Loads specify allowable pollutant loads from all sources (point, non-point, and natural) for a given watershed.

State Water Resources Control Board and Regional Water Quality Control Boards

The State Water Resources Control Board administers water rights, sets water pollution control policy, and issues water board orders on matters of statewide application, and oversees water quality functions throughout the state by approving Basin Plans, Total Maximum Daily Loads, and National Pollutant Discharge Elimination System permits. Regional Water Quality Control Boards are responsible for protecting beneficial uses of water resources within their regional jurisdiction using planning, permitting, and enforcement authorities to meet this responsibility.

National Pollutant Discharge Elimination System Program

Municipal Separate Storm Sewer System Program (MS4)

Section 402(p) of the Clean Water Act requires the issuance of National Pollutant Discharge Elimination System permits for five categories of storm water discharges, including Municipal Separate Storm Sewer Systems (MS4s). An MS4 is defined as "any conveyance or system of conveyances (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, human-made channels, and storm drains) owned or operated by a state, city, town, county, or other public body having jurisdiction over storm water, that is designed or

used for collecting or conveying storm water." The State Water Resources Control Board has identified the Department as an owner/operator of an MS4 under federal regulations. The Department's MS4 permit covers all Department rights-of-way, properties, facilities, and activities in the state. The State Water Resources Control Board or the Regional Water Quality Control Board issues National Pollutant Discharge Elimination System permits for five years, and permit requirements remain active until a new permit has been adopted.

The Department's MS4 Permit (Order No. 2012-0011-DWQ) was adopted on September 19, 2012 and became effective on July 1, 2013. The permit has three basic requirements:

1. The Department must comply with the requirements of the Construction General Permit (see below);

2. The Department must implement a year-round program in all parts of the State to effectively control storm water and non-storm water discharges; and

3. The Department storm water discharges must meet water quality standards through implementation of permanent and temporary (construction) best management practices, to the Maximum Extent Practicable, and other measures as the State Water Resources Control Board determines to be necessary to meet the water quality standards.

To comply with the permit, the Department developed the Statewide Storm Water Management Plan to address storm water pollution controls related to highway planning, design, construction, and maintenance activities throughout California. The Statewide Storm Water Management Plan assigns responsibilities within the Department for implementing storm water management procedures and practices as well as training, public education and participation, monitoring and research, program evaluation, and reporting activities. The Statewide Storm Water Management Plan describes the minimum procedures and practices the Department uses to reduce pollutants in storm water and non-storm water discharges. It outlines procedures and responsibilities for protecting water quality, including the selection and implementation of best management practices. The project will be programmed to follow the guidelines and procedures outlined in the latest Statewide Storm Water Management Plan to address storm water runoff.

Construction General Permit

Construction General Permit (Order No. 2009-009-DWQ), adopted on September 2, 2009, became effective on July 1, 2010. The permit regulates storm water discharges from construction sites that result in a Disturbed Soil Area (DSA) of one acre or greater, and/or are

smaller sites that are part of a larger common plan of development. By law, all storm water discharges associated with construction activity where clearing, grading, and excavation result in soil disturbance of at least one acre must comply with the provisions of the General Construction Permit. Construction activity that results in soil disturbances of less than one acre is subject to this Construction General Permit if there is potential for significant water quality impairment resulting from the activity as determined by the Regional Water Quality Control Board. Operators of regulated construction sites are required to develop storm water pollution prevention plans; to implement sediment, erosion, and pollution prevention control measures; and to obtain coverage under the Construction General Permit.

The 2009 Construction General Permit separates projects into Risk Levels 1, 2, or 3. Risk levels are determined during the planning and design phases, and are based on potential erosion and transport to receiving waters. Requirements apply according to the Risk Level determined. For example, a Risk Level 3 (highest risk) project would require compulsory storm water runoff pH and turbidity monitoring, and before construction and after construction aquatic biological assessments during specified seasonal windows. For all projects subject to the permit, applicants are required to develop and implement an effective Storm Water Pollution Prevention Plan (SWPPP). In accordance with the Department's Standard Specifications, a Water Pollution Control Plan (WPCP) is necessary for projects with DSA less than one acre.

Section 401 Permitting

Under Section 401 of the Clean Water Act, any project requiring a federal license or permit that may result in a discharge to a water of the U.S. must obtain a 401 Certification, which certifies that the project will be in compliance with state water quality standards. The most common federal permits triggering 401 Certification are Clean Water Act Section 404 permits issued by the U.S. Army Corps of Engineers. The 401 permit certifications are obtained from the appropriate Regional Water Quality Control Board, dependent on the project location, and are required before the U.S. Army Corps of Engineers issues a 404 permit.

In some cases, the Regional Water Quality Control Board may have specific concerns with discharges associated with a project. As a result, the Regional Water Quality Control Board may issue a set of requirements known as Waste Discharge Requirements under the State Water Code (Porter-Cologne Act) that define activities, such as the inclusion of specific features, effluent limitations, monitoring, and plan submittals that are to be implemented for protecting or benefiting water quality. Waste Discharge Requirements can be issued to address both permanent and temporary discharges of a project.

Affected Environment

The following information comes from the Hydrologic, Hydraulic and Water Quality Technical Study completed for the project, which is included with the Combined Technical Reports document of this environmental impact report (Appendix D).

The technical study concluded that no water features within the study area are subject to Regional Water Quality Control Board and California Department of Fish and Wildlife jurisdiction or a Clean Water Act Section 404 jurisdictional nationwide permit. The project study area is defined as the area in which the U.S. Army Corps of Engineers, Regional Water Quality Control Board, and California Department of Fish and Wildlife jurisdiction was assessed and quantified. The study area includes the project's proposed physical ground disturbance footprint in addition to relevant portions of the Middle Kern-Upper Tehachapi-Grapevine Watershed. The Middle Kern-Upper Tehachapi-Grapevine Watershed encompasses 1,310 square miles in the Grapevine Hydrologic Unit.

Three intermittent creeks run through the study area: Tweedy Creek, Tehachapi Creek, and Caliente Creek. Tweedy, Tehachapi, and Caliente creeks are part of the Tehachapi Hydrologic Area, which drains a 290,099-acre watershed.

Tweedy Creek, a small ephemeral tributary to Tehachapi Creek, flows east and parallel to the Project for approximately 1.3 miles between both project segments. Tweedy Creek crosses the study area at the following mileposts.

- Mile post 347.5
- Mile post 347.3

Tehachapi Creek flows northwest and parallels the project for about 11.4 miles within the upper elevation portion of the project. It passes through the study area at the following locations:

- Mile post 346.8
- Mile post 335.9

According to the U.S. Department of Agriculture soil survey, lower Caliente Creek is dry for most of the year, but on rare occasions reaches the city of Lamont (about 11 miles west of the study area) where flows flood the streets, leaving deep mud deposits. The Bena 7.5-minute U.S. Geological Survey quadrangle map shows Caliente Creek as an intermittent blue line feature as it flows down-slope, changing from an intermittent stream to a temporary (or ephemeral) wash as it reaches the valley floor.

Water Quality Assessments and Water Quality Objectives

To determine the water quality thresholds for the project, the Central Valley Regional Water Quality Control Board Tulare Lake Basin Plan was reviewed. According to the plan, the project is within the Grapevine and South Valley Floor Hydrologic Subunits (56 and 57, respectively). There are no listed water quality assessments by the U.S. Environmental Protection Agency or State Water Resources Control Board for any project-affected surface water bodies. Based on the Central Valley Regional Water Quality Control Board Basin Plan, beneficial uses for the Caliente and Tehachapi creeks include municipal, agricultural, recreation-water contact and non-contact, commercial, warm and cold habitat and wildlife. Beneficial groundwater uses are designated in a similar manner as surface water criteria. Water quality objectives are not set for the listed groundwater hydrogeologic basin.

Environmental Consequences

Build Alternative

Construction Impact

Potential impacts from the Build Alternative would occur mainly during construction. Grading activities would include embankment fills and slope cuts; sediment runoff is the expected pollutant from grading activities. Additional potential pollutants would include oil and grease from equipment, and trash and debris (floatables) from general activities and accidental spills. However, water quality impacts are not expected for this project for the following reasons: 1) water quality objectives would not be affected as a consequence of the project, and 2) no impacts to beneficial uses of regional water bodies are expected other than the potential for temporary construction impacts, which would be eliminated through use of best management practices outlined in the project's Storm Water Pollution Prevention Plan. Floating material, oil and grease, and sediment are the only expected or possible pollutants that may affect beneficial uses of surface water and groundwater during construction. Minimization measures have been incorporated to address this issue.

Operational Impact

Railroad activity occurs along the entire project alignment. Any additional rail traffic and operations would not cause additional impacts to water quality. Continued operation of the railroad would also involve intermittent railroad track maintenance. Typical non-emergency railroad maintenance and repairs include rail and tie adjustments, ballast replacement and right-of-way maintenance, which will also have minimal impacts to the local water bodies.

Reduced-Segment Alternative

Activities that occur during the construction and the operation of the Reduced-Segment Alternative would be similar to those that occur during the Build Alternative. Analysis of the

Build Alternative did not identify unique challenges or impacts for either of the two project segments. As a result, construction of the Walong to Marcel segment as a result of the Reduced-Segment Alternative would not produce a noticeable difference in project impacts. The environmental consequences, as well as the proposed minimization measure, for the Reduced-Segment Alternative would be the same as those for the Build Alternative.

No-Build Alternative

Under the No-Build Alternative, the project would not be built and the existing conditions would remain unchanged. There would be no construction, operational, or cumulative impacts as a result of the No-Build Alternative.

Avoidance, Minimization, and/or Mitigation Measures

Potential impacts from the Build Alternative would occur mainly during construction. To reduce construction impacts and to ensure compliance with best management practices, BNSF would implement the following minimization measures:

Grading and construction plans submitted by the Applicant shall meet the requirements of the State Water Resources Control Board National Pollutant Discharge Elimination System Statewide General Permit for Storm Water Discharges Associated with Construction Activity Permit (Final Order No. 2012-011-DWQ, NPDES No. CAS000003). Review and approval of grading and construction plans shall be the responsibility of Caltrans and the County of Kern Public Works and Building Departments.

BNSF would submit for review and approval to Caltrans and the County of Kern Public Works Department a construction Storm Water Pollution Prevention Plan for the entire project. The Storm Water Pollution Prevention Plan would be implemented throughout the duration of the project (currently Water Quality Order 99-08-WQ; as of July 2010: Order No. 2009-0009-DWQ as amended by 2010-0014-DWG), adopted on November 16, 2010, and became effective on February 14, 2011).

Design best management practices include consideration of downstream effects, preservation of existing vegetation, concentrated conveyance systems, slope/surface protection systems, and structural treatment devices, soil stabilization practices, sediment control, erosion control, tracking control, as well as other measures listed in Section 9.2 of the Hydrology, Hydraulic and Water Quality Technical Report (April 2012).

2.2.3 Geology/Soils/Seismic/Topography

Regulatory Setting

For geologic and topographic features, the key federal law is the Historic Sites Act of 1935, which establishes a national registry of natural landmarks and protects "outstanding examples of major geological features." Topographic and geologic features are also protected under the California Environmental Quality Act.

This section also discusses geology, soils, and seismic concerns as they relate to public safety and project design. Earthquakes are prime considerations in the design and retrofit of structures. The Department's Office of Earthquake Engineering is responsible for assessing the seismic hazard for Department projects. Structures are designed using the Department's Seismic Design Criteria (SDC). The SDC provides the minimum seismic requirements for highway bridges designed in California. A bridge's category and classification will determine its seismic performance level and which methods are used for estimating the seismic demands and structural capabilities. For more information, please see the Department's Division of Engineering Services, Office of Earthquake Engineering, Seismic Design Criteria.

Affected Environment

A Geologic Hazards and Soils Technical Report was completed in March 2013 for this project and has been included with the Combined Technical Reports document of this environmental impact report (Appendix D).

Geologic Setting

The project lies in the Tehachapi Mountains in the southern portion of the Sierra Nevada Geomorphic Province. In the project vicinity, the White Wolf Fault marks the southern boundary between the Central Valley and Sierra Nevada provinces. Elevations in this area range from about 2,110 feet to 2,800 feet above mean sea level with adjacent topography extending above at 3,200 feet and below at 875 feet above mean sea level. The project area is characterized by stream valleys with steep slopes and ridges.

The Geologic Hazards and Soils Technical Report noted that geologic features in the project area included uplifted crystalline rocks of varying granitic composition forming ridges and steep slopes, with narrow v-shaped alluvial-filled valleys. The main rock types included diorite, quartz diorite, and to a lesser extent, granodiorite. The alluvial fill is typically 15 to 80 feet thick (see the Geologic Hazards and Soils Technical Report).

Table 2.2-1 provides a summary of the geologic conditions found during field observations of the project area.

Table 2.2-1 Geologic Conditions – Summary of Field Observations

Segment Name	Mile Post Numbers	Observations
Cliff Siding Extension	343.3 to 343.64	Tonalite is the predominant lithology of this section (note, in some references tonalite is used synonymously to quartz diorite, although current International Union of the Geological Sciences classification defines tonalite as having greater than 20 percent quartz and quartz diorite with from 5 to 20 percent quartz). At mile post 343.64 near Tunnel 7, this rock type was mildly altered, having some foliation and quartz-filled veins. The slopes exposing the tonalite appeared to be steep (70 to 90 degree slopes), stable, and undergoing moderate soil development. Erosional scours were also seen on the slope just below the tracks.
Walong to Marcel	352.07 to 353.08	The rock type in this section is consistent with diorite and was visible in cuts having 70 to 90 degree slopes. Appearing as well-weathered granitic rock, it ranged from relatively massive to significantly fractured and contained significant muscovite on a ridge, near the tunnel occupying this site segment. One fracture contained quartz and was altered, showing evidence of shearing. The rock also showed considerable soil development, especially in one cut, and included grus toward the southern end of this segment. Other materials in this segment included imported fill, railroad ballast, and other rock types. At mile post 352.08, the fill existed in a stockpile, which was not compacted. The ballast mainly occupied the track area, but spilled onto adjoining slopes at selected locations. The other rock type was schist near the tunnel in this segment.

Historical Seismicity

The sediments and rocks (consolidated sedimentary and igneous materials) lie in a tectonically active area with a high rate of seismicity. Major seismic zones in the immediate project area include the Garlock Fault zone, between the Sierra Nevada and Mojave Geomorphic Provinces, and the White Wolf Fault zone, locally separating the Sierra Nevada Geomorphic Province from the Central Valley Geomorphic Province.

Figure 2.2-4, Earthquake Fault Zones, shows a map of the faults in the project area.

The White Wolf Fault, one of two faults that cross the railroad tracks where the project sits, crosses just west of mile post 343.3, where it separates two district soil types (Bealville fanglomerate on the northwest and diorite on the southeast). The Edison Fault, near mile post 338.04, is the second fault that crosses the railroad tracks. It is characterized by vertical displacement during an earthquake, and it separates two soil types (gabbro diorite on the south and the Bealville fanglomerate on the north).

Geologic Hazards

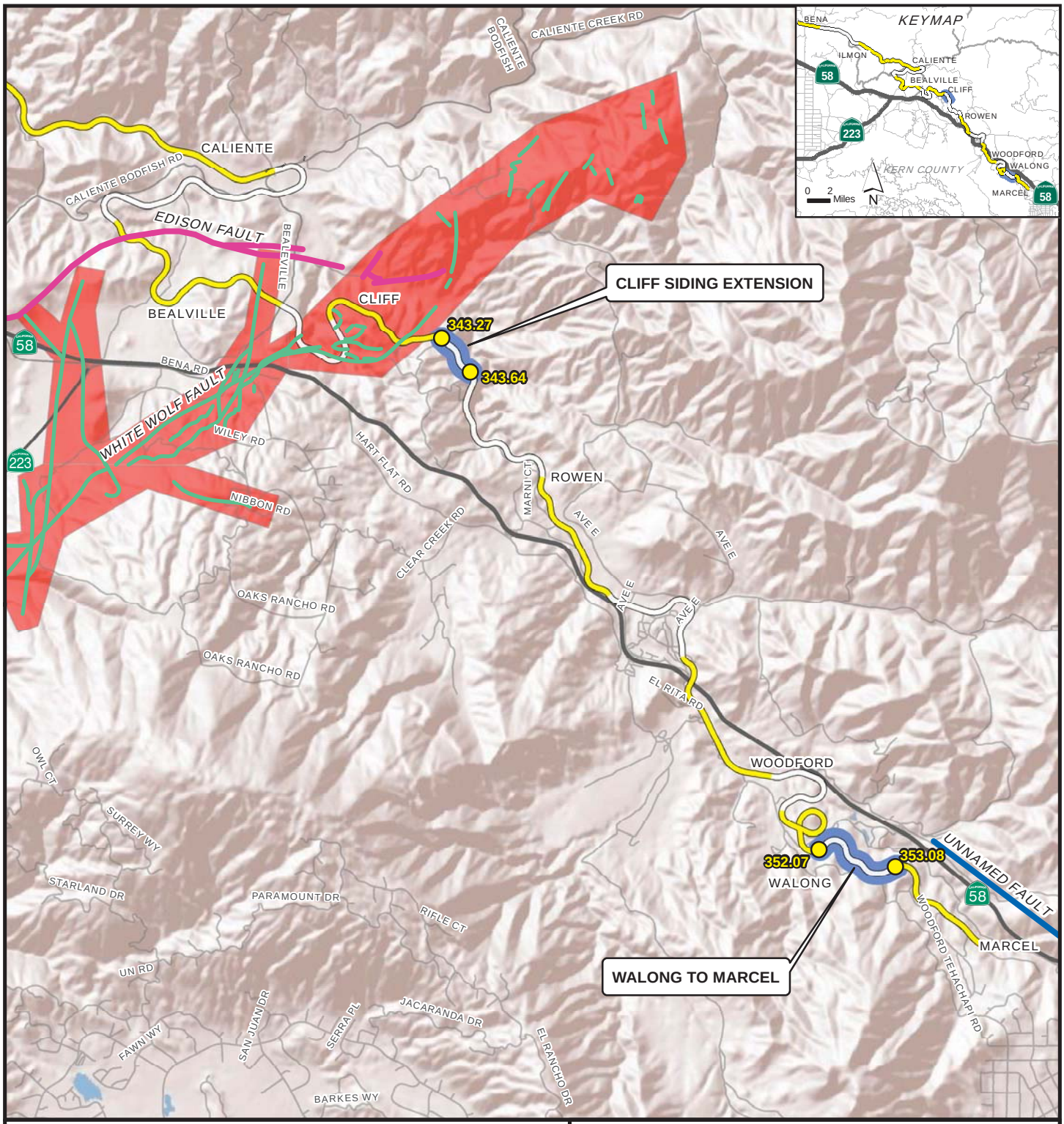
Fault Rupture

The faults pose a potential for fault rupture beneath the site area and vicinity. Based on geologic references, the White Wolf Fault and Garlock Fault have been zoned as active Earthquake Fault Hazard Zones by the State of California's Alquist-Priolo Act. Secondary and tertiary strands of the White Wolf Fault and Garlock Fault would also be part of these hazard zones. The Edison Fault is not classified as active under Alquist-Priolo.

Ground Shaking

There is a potential for substantial ground motions to be felt within the project area, given the location within a seismically active region. Two faults in the site vicinity with the greatest potential to cause ground motions include the White Wolf Fault and the Garlock Fault.

Trending southwest to northeast, the White Wolf Fault is 40 miles long. It is a left-lateral reverse fault variety that dips southeast. The fault extends from Wheeler Ridge to Caliente, California, and coincides with the western side of the Tehachapi Mountain Range. This fault is a significant concern for the project, given its proximity to the site segments. Once considered inactive, the fault was the source of the Tehachapi Earthquake that occurred in 1952 with a magnitude of 7.3. The town of Tehachapi received considerable damage, and the ground surface was significantly disrupted in some locations. Near the northeast side of Bear Mountain, the White Wolf Fault moved vertically 2 feet and horizontally 1.5 feet. According to the Southern California Earthquake Data Center, White Wolf Fault has a potential maximum credible magnitude of 7.5.



Sources: JL Patterson & Associates; So Cal Earthquake Center (SCEC), 2011; USGS AP Zones, 2011.

Legend

BNSF TEHACHAPI

- Segment Milepost
- Project Segments
- Existing Single Track Not in Project
- Existing Double Track Not in Project
- Highway
- Road

USGS /Alquist Priolo Fault Zone

- Whitewolf Fault
- Edison Fault
- Unnamed Fault
- CA AP Zones

0 1.3 Miles

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Earthquake Fault Zones

March 2013

Figure 2.2-4

Caltrans

Trending northeast, the Garlock Fault, which has a left-lateral movement, extends about 150 miles from the San Andreas Fault on the southwest to Death Valley on the northeast end of the fault. Surface ruptures caused by earthquakes along this fault have not occurred during historical time, so movement on the fault is based on field investigations. The most recent sizable earthquake recorded for the Garlock Fault Zone was a magnitude 5.7 on July 11, 1992 near the town of Mojave. Information obtained during the investigation indicates that 9 to 17 events have occurred within the last 14,530 to 14,830 years and an average recurrence interval ranging from 700 to 1,600 years. According to the Southern California Earthquake Data Center, this fault has a potential maximum credible magnitude of 7.78.

Seismically Induced Settlements and Liquefaction

Seismically induced soil liquefaction is a phenomenon in which water-saturated sandy soils behave like jelly during a seismic event, resulting in surface damage including surface subsidence, slope failures, and lateral spreading. Due to the presence of dry, sandy alluvium in the vicinity of various segments of the railroad tracks, the potential for liquefaction near the project site could occur. However, the Geologic Hazards and Soils Technical Report indicates that these areas are shallow; this limits these events to the upper levels of alluvial soil near the project site, causing movement to occur relatively uniformly. In addition, the sandy soils are not right at the project site. The project site instead has very coarse-grained soil. The coarse grains in the soil greatly limit the project's susceptibility to liquefaction.

Collapsible and Expansive Soils

Expansive soils are not well represented within the general alignment; instead, the project area features alluvial and wash deposits that are generally very coarse and are not considered highly susceptible to collapse upon hydrocompaction. The Geologic Hazards and Soils Technical Report for the project segments indicates that the potential for soil collapse and expansive soils presents minimal risk to the project.

Landslides and Slope Stability

The likelihood of a landslide depends on various factors: presence and orientation of fractures, faults, and clay beds; height and steepness of slopes; presence and quantity of groundwater; and occurrence and intensity of seismic shaking. Based on site observations, the predominant rock types that underlie each segment appeared stable and displayed no significant evidence of landslides. The Geologic Hazards and Soils Technical Report concluded that there is minimal risk of slope instability.

Soil Resources

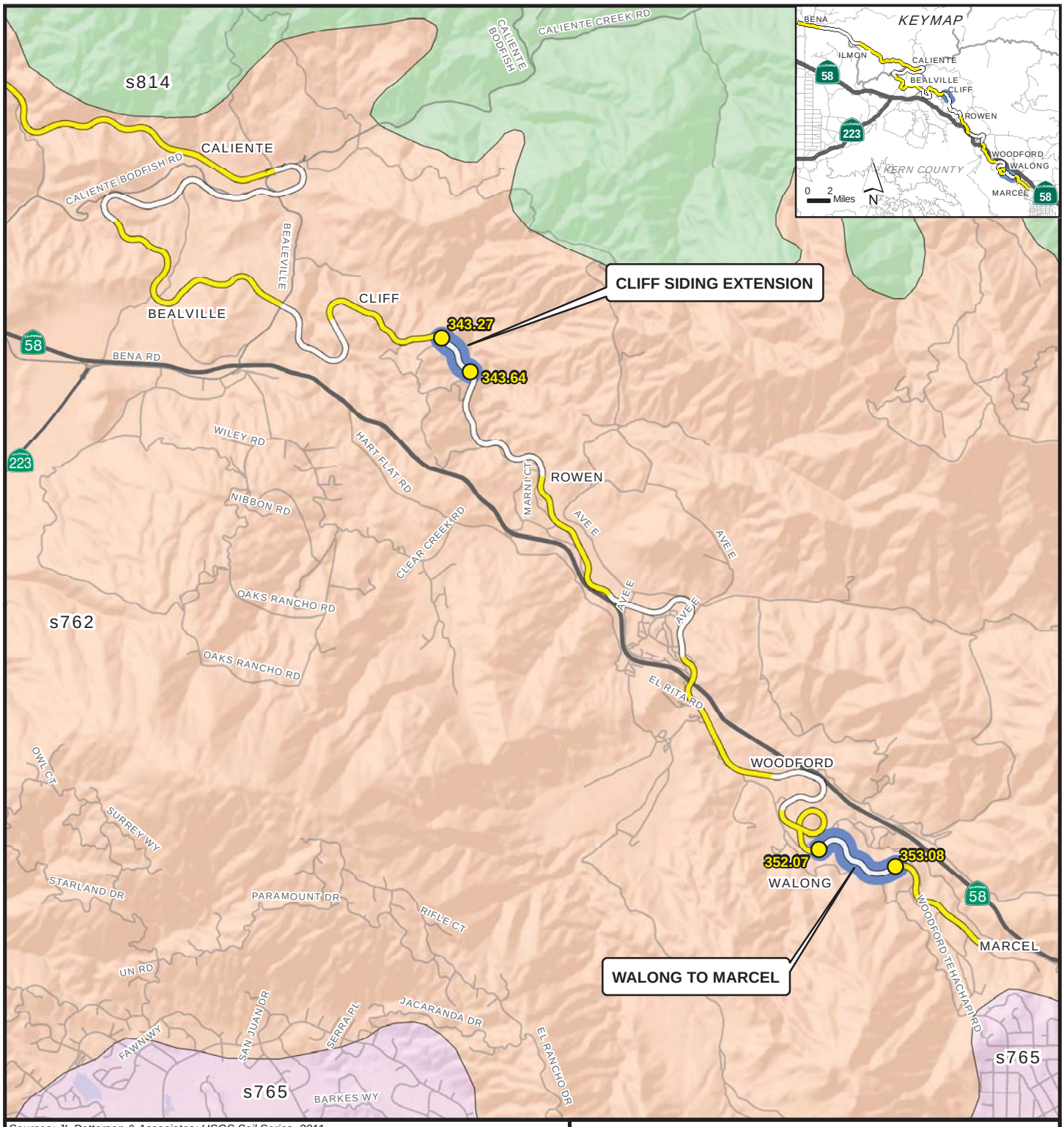
The two project segments have multiple soil family associations or complexes based on a review of the California Soil Survey performed by the U.S. Department of Agriculture (U.S. Department of Agriculture, 2009).

Table 2.2-2 and Figure 2.2-5 show the soil types in the area of the track segments.

Table 2.2-2 Soil Conditions – Distribution of Soil Types

Site Segment	Mile Post Numbers	Soil Association/Complexes
Cliff Siding Extension	343.3-343.64	194. Walong sandy loam, 30 to 50 percent slopes
		271ne. Walong-Tunis-Rock outcrop association, 30 to 60 percent slopes
		277, 277ne. Feethill-Vista-Walong association, 15 to 60 percent slopes
Walong-to-Marcel	352.07-353.08	107. Arujo-Friant-Tunis, 15 to 50 percent slopes
		141. Havala sandy loam, 2 to 5 percent slopes
		193. Chanac-Pleito, 15 to 60 percent slopes
		195. Walong-Arujo sandy loams, 15 to 30 percent slopes
		199. Walong-Edmundston association, steep

Although the Tehachapi area has a rich history of mining and exploration, the project area is not within an area of high mineral resources. Also, the project segments are not associated with land identified as containing mineral deposits of regional and statewide significance according to the Kern County General Plan Land Use, Open Space and Conservation Element. There are no mining activities currently within the project area or on adjacent properties, nor are any expected at this time due to the steep topography, limited extent of alluvium, and small area in which mining could occur near the project segments.



Sources: JL Patterson & Associates; USGS Soil Series, 2011.

Legend

BNSF TEHACHAPI

- Segment Milepost
- Project Segments
- Existing Single Track Not in Project
- Existing Double Track Not in Project
- Highway
- Road

USGS Soil Series Distribution 2011

- s762, Walong-Rock outcrop-Edmundston-Anaverde (s762)
- s765, Tehachapi-Steuber-Havala (s765)
- s814, Soper-Rock outcrop-Jilson-Dunnlake (s814)

0 1.3 Miles

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Project Area Soil Resources

March 2013

Figure 2.2-5

Caltrans

Environmental Consequences

Build Alternative

Construction and Operational Impacts

Geologic Hazards

Fault Rupture/Ground Shaking

The impacts of earthquake-related hazards under the Build Alternative are considered moderate based on the analysis presented in the geology report included with the Combined Technical Reports document of this environmental impact report. However, some degree of rupture is possible, especially in the Cliff Siding Extension, which borders a fault.

Risks to the operation of the railroad are typically mitigated as a result of modern railroad track design. Railroads use track ballasts, which significantly minimize risks associated with the expected ground shaking and rupture events. Track ballasts are made from crushed stone and form the track bed upon which railroad ties are placed. The ballasts are designed to bear the load of the train and are able to flex for stability. As a result, catastrophic structural failure or loss of life is not expected during typical seismic events that occur in the project area and throughout California.

Surface rupturing caused by movement along the White Wolf Fault or other faults could displace and distort the tracks and result in full or partial closure until repairs can be completed. Much smaller displacements are expected on lesser faults or splays off of the primary faults. These smaller displacements would have less potential for disruption of the rail lines given their construction on a raised surface of ballast and sub-ballast. As standard practice, evaluation of expected displacements and their potential impacts to the rail-ballast should be considered in the final design process. Minimization measures would be implemented to address such issues.

Seismically Induced Settlements and Liquefaction

As stated in the Affected Environment section, the project area features soil types that are not associated with liquefaction-type events. A risk of loss, injury, or death during construction is unlikely to occur and there are no significant risks or impacts associated with the project.

Collapsible and Expansive Soils

The Geologic Hazards and Soils Technical Report prepared for the project indicates that the project area does not feature expansive-type soils. Instead, the two segments typically feature

bedrock, and in some locations also feature a coarse alluvial deposit, which would not qualify as an expansive-type soil. Risks to life and property would be minimal during construction activities.

Landslides

A study of the site segments revealed no evidence of landslides having occurred in the project area. However, the study area has some susceptibility to landslides, erosion, or mass movements for the following reasons:

- The structural geology of the area results in dipping strata that can promote slip surfaces.
- Common faults and fractures are present. In particular, the White Wolf Fault passes along the western margin of the Cliff Siding Extension (mile posts 343.3 to 343.64). This fault passes through crystalline rocks, which may rupture, but generally have a moderate potential for landslides. Ground shaking attributable to this or other faults would have a greater potential to induce landslides in the sedimentary rocks described in this section. The tectonic setting suggests that high levels of ground shaking may occur.

Mitigation of this hazard includes design-level geotechnical studies to evaluate the hazard and propose appropriate design measures to lessen impacts. Designs to reduce or avoid impacts from landslides or potential slope instability would be implemented during project construction.

Implementation of the minimization measures would reduce, to the extent possible, the potential for landslides through project design and use of appropriate best management practices; however, as there is no possibility to minimize for landslide-causing natural disasters (earthquakes), potential impacts for landslides would remain. Stabilizing existing landslide locations would potentially mitigate areas that would remain prone to slope failure under the No-Build Alternative. Once the project were in operation, regular safety inspection and maintenance would help minimize impacts of slope by providing for preventive maintenance and repair to areas with slide potential. Potential interruption of rail operations and damage to structures that can be repaired potentially could occur, but catastrophic structural failure and/or loss of life is not expected.

The impacts of landslides are not expected to be substantial in the project area, as they would have localized impacts that could potentially cause short-term disruption of activity. The transportation of hazardous materials by rail through the project area lends to the potential for the derailment of a train carrying these materials and its subsequent release. Impacts related to the release of hazardous materials are described in Section 2.2.5.

Soil/Mineral Resources

The earthwork required to develop the site segments would include such activities as grubbing, grading, excavating, and backfilling. Earthwork would be done to provide adequate foundation conditions for the proposed route and to establish the grades of each site segment. The grading plan would incorporate civil design considerations for drainage control and flood constraints. The proposed grading would change the existing soil profiles by mixing elements and would alter the physical, chemical, and biological characteristics of the native soils. Clearing of any protective vegetation and subsequent soil disturbance activities would likely result in a minor short-term increase in both water use and wind erosion rates. According to the geology report, the site has a relatively moderate to high potential for erosion based on the soils along the route.

No permanent impacts to soil resources are expected by construction or maintenance operations associated with the Build Alternative. Appropriate construction and maintenance techniques would help minimize any potential temporary soil erosion impacts. The Build Alternative could adversely affect soils, mainly if construction activities increase soil erosion rates. Minimization measures would be used to reduce erosion from a construction and operations standpoint.

Reduced-Segment Alternative

Under the Reduced-Segment Alternative, the Cliff Siding Extension would not be built, and impacts related to geology/soils would be eliminated in this section. Site-specific impacts in the Cliff Siding Extension would not occur. In the Walong to Marcel segment, geologic impacts under the Reduced-Segment Alternative would be the same as those under the Build Alternative.

Construction and Operational Impacts

Geologic Hazards

Fault Rupture/Ground Shaking

There would be expected impacts of fault rupture or ground shaking on maintenance and operations under the Reduced-Segment Alternative, similar to those for the Built Alternative. Large seismic-related events could cause potential interruption of train operations and damage to embankments and structures, but would not likely result in catastrophic structural failure or loss of life. The existing railway structures have been designed to withstand most earth movements; therefore, the impacts of ground shaking during a nearby major earthquake are expected to be minimal.

Seismically Induced Settlements and Liquefaction

The project area of the Reduced-Segment Alternative features soil types that are not associated with liquefaction and related phenomena. Expansion of the rail system at the reduced project segment would not create additional risks to liquefaction during seismic events. Therefore, no adverse effects related to liquefaction and related phenomena would occur.

Collapsible and Expansive Soils

The Reduced-Segment Alternative is located on lands that typically feature bedrock and, in some locations, may also feature a coarse alluvial deposit. These soils would not qualify as an expansive-type soil, and risks to life and property would be minimal during operation of the expanded. Therefore, no adverse effects related to soil collapse or expansion would occur.

Landslides and Slope Stability

As discussed in the Affected Environment section, the Cliff Siding Extension has some potential for landslides based on existing geologic conditions. However, the Reduced-Segment Alternative would expand only the Walong to Marcel segment and would not result in improvements along areas that have a potential for landslide-related phenomenon. No change to existing conditions is expected to occur.

Soil Resources

The Reduced-Segment Alternative would result in grading that would be completed during the construction phase. However, minimization measures have been appropriately created to address these issues and to ensure that erosion does not occur after completion. No permanent impacts to soil resources are expected as a result of railroad operations and the related maintenance that is associated with the Build Alternative.

No-Build Alternative

Construction and Operational Impacts

Geologic Hazards

Fault Rupture/Ground Shaking

There would be anticipated impacts of fault rupture or ground shaking on maintenance and operations under the No-Build Alternative. The existing BNSF structures have been designed to withstand most earth movements; therefore, the impacts of ground shaking during a nearby

major earthquake are expected to be small, in that a quake could cause potential interruption of train operations and damage to embankments and some structures that could be repaired, but not cause catastrophic structural failure or loss of life. The impacts of ground shaking during smaller or distant earthquakes, as well as the impacts of other earthquake-related hazards such as liquefaction, are not expected to substantially affect train operations.

Seismically Induced Settlements and Liquefaction

The No-Build Alternative would not involve construction or any long-term operational changes that would affect existing conditions. Therefore, no adverse effects related to liquefaction and related phenomena would occur.

Collapsible and Expansive Soils

The No-Build Alternative would not involve construction or any long-term operational changes that would affect existing conditions. Therefore, no adverse effects related to soil collapse or expansion would occur.

Landslides

As discussed under the Build Alternative above, the area containing the site segments has some potential for landslides based on existing geologic conditions. Even with the No-Build Alternative, there is a potential for impacts to operations due to landslides within the area. Some potential landslide areas would not be stabilized in an effort to lessen or eliminate the threat of a slide as would be done under the proposed Build Alternative. No change to existing conditions is expected.

Soil/Mineral Resources

The No-Build Alternative would not result in any grading or earth-moving activities, which could affect existing conditions. No impacts to soil resources, including the likelihood of erosion or the ability of the soil to support wastewater systems, would occur.

Avoidance, Minimization, and/or Mitigation Measures

Minimization Measures

- During seismic events, train operators and maintenance staff shall take the following steps to ensure continued safe operation of the train:
- Stop rail traffic if ground shaking is experienced.
- Careful examination of the tracks and adjacent areas throughout the project area with a focus on identified fault crossings.

- Repair of any areas of deflected or distressed track and restore/re-level any areas of differential settlement or disturbed ballast.
- To reduce the potential disruption to train operations from landslides, the project proponent would implement the following minimization measures:
- During final project design and before project grading, BNSF would improve stability of cut slopes identified by the project geotechnical engineers with structural elements like tiebacks or soil nails.
- If a landslide should affect the rail corridor, BNSF would stabilize landslides by remedial grading or other methods, if economically feasible.
- Reduce slope inclinations to minimize slope instability.
- The applicant will implement measures to minimize erosion from a construction and operations standpoint. These measures would include preparation of a Storm Water Pollution Prevention Plan, a dust control plan, and a re-vegetation plan that would address the following:
    - Soil stabilization practices.
    - Control practices to reduce wind erosion of soil stock piles and construction areas.
    - Standard construction and operation practices to minimize dust.
    - Stabilization of soil in areas of disturbance by establishing appropriate vegetation.

2.2.4 Paleontology

Regulatory Setting

Paleontology is a natural science focused on the study of ancient animal and plant life as it is preserved in the geologic record as fossils.

Under California law, paleontological resources are protected by the California Environmental Quality Act.

Affected Environment

The analysis and conclusions in this section are based on the results of a Paleontological Identification Report (PIR) that was completed in May 2013. The report is included with the Combined Technical Reports document of this environmental impact report (Appendix D).

The project lies within the Tehachapi Mountains at the southern end of the Sierra Nevada geomorphic province. Available geologic maps and a walking survey done in the project area indicate that there are upwards of seven geologic units in the segments where new track would be built. Archival research indicates that the proposed project segments lie on three U.S. Geological Survey 7.5' quadrangles: Bena, Oiler Peak, and Keene. Field surveys were done to identify and document exposed paleontological resources in the project area and determine the potential proposed construction-related impacts and their significance to these resources. A paleontological records search was done through the Natural History Museum of Los Angeles County (LACM). Published and unpublished literature was studied to augment the records received from that institution.

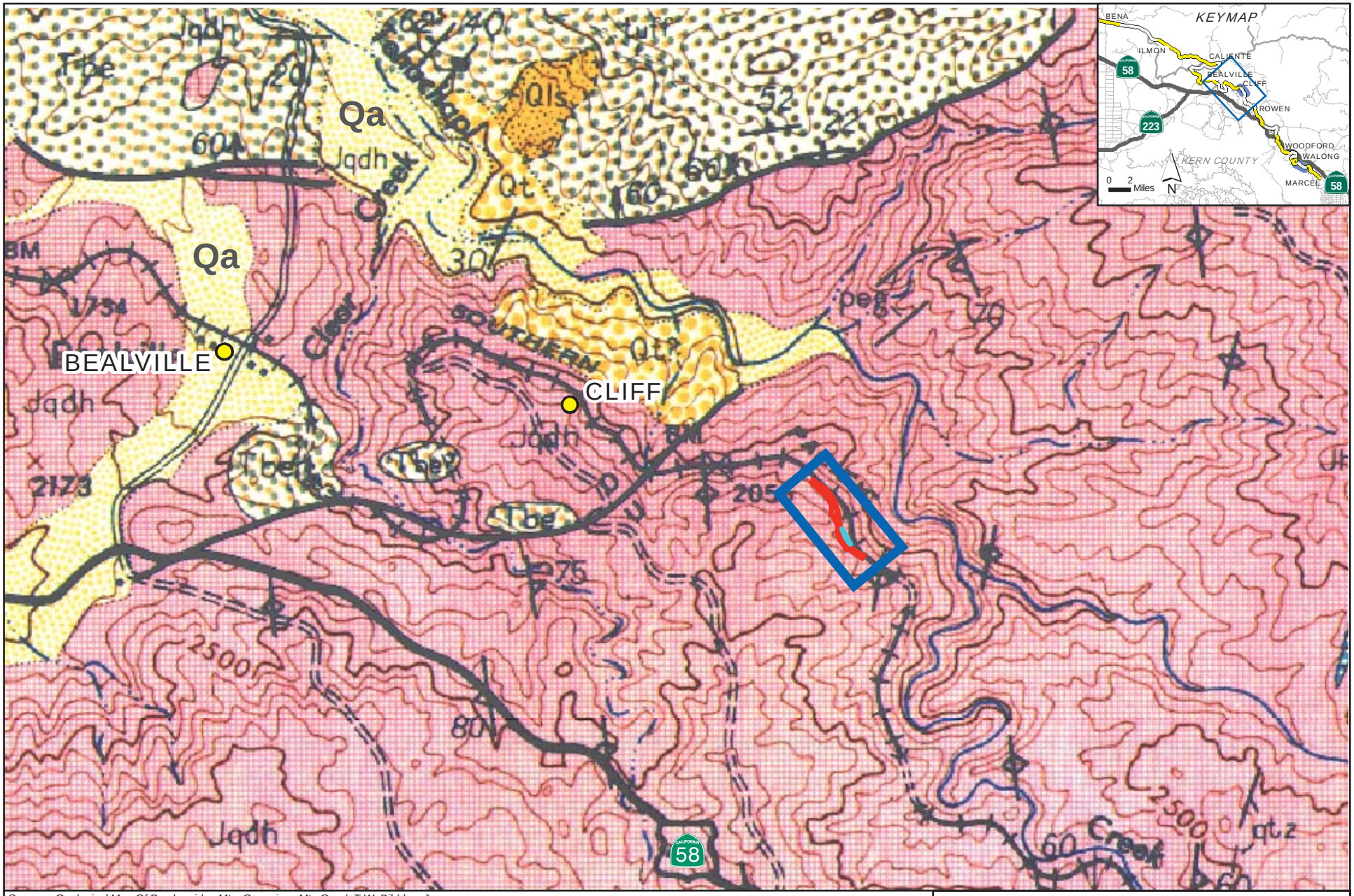
Results of mapping analyses indicate that there are three geologic units that underlay the Cliff Siding Extension and Walong to Marcel segment, and can be viewed in Figure 2.2-6 and Figure 2.2-7, respectively. These geologic units include Granite, Youngest Quaternary alluvium, and Quaternary Soils. Specifically, the Cliff Siding Extension segment is mapped as underlain by biotite-hornblend-quartz diorite (Dibblee and Warne 1970), and the Walong to Marcel segment is underlain by granite, with a small portion of the west end identified as Young Quaternary alluvium (Dibblee and Warne 1970).

Environmental Consequences

Build Alternative

Construction and Operational Impacts

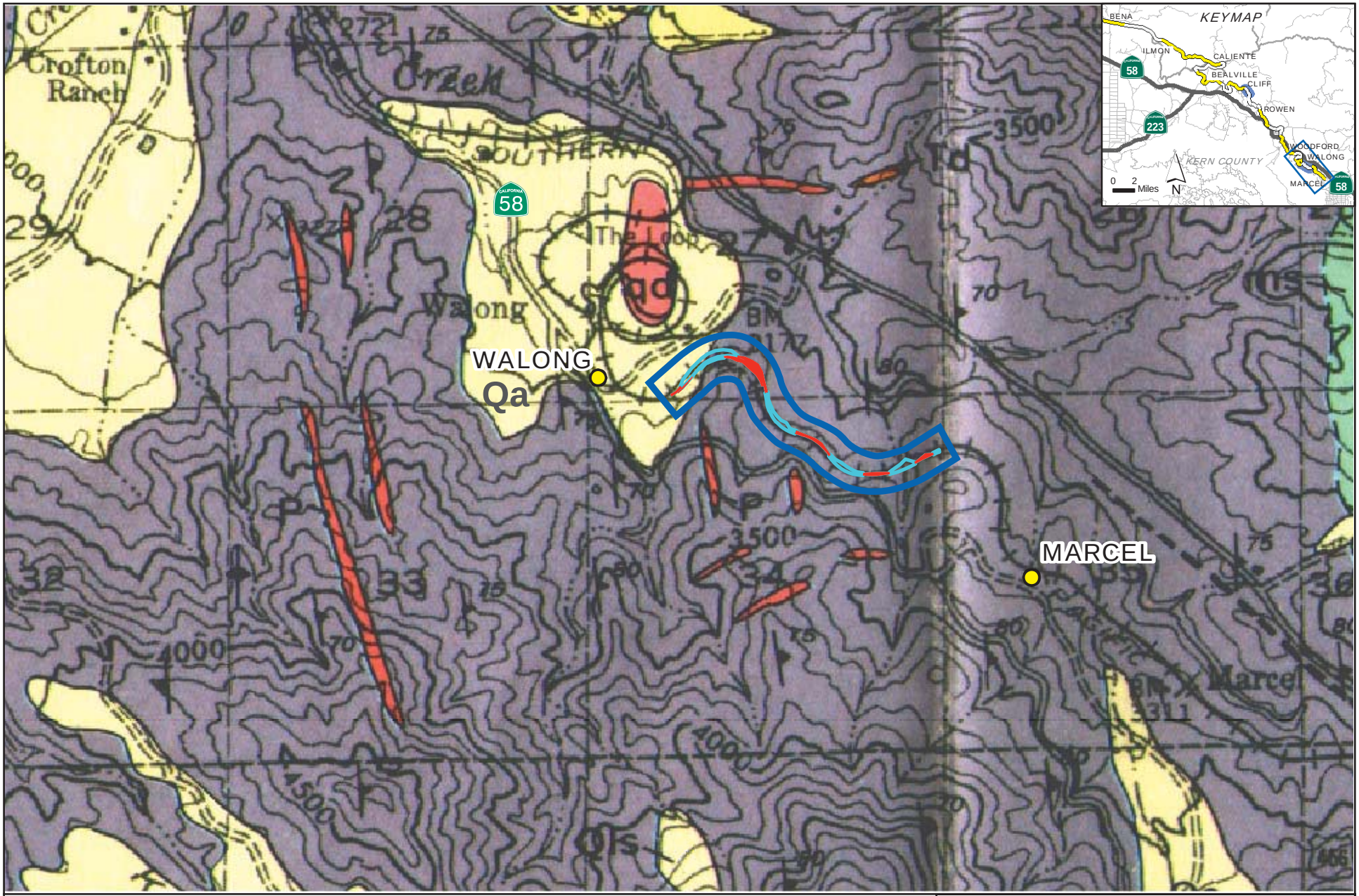
Caltrans' Standard Environmental Reference (Caltrans 2007) provides guidance for assessing paleontological resources relative to a project. The Standard Environmental Reference specifically uses a three-part scale to identify substrate classifications and to rank them as High, Low, and No Potential for their potential to yield significant paleontological resources. According to Caltrans' Standard Environmental Reference, the geologic formations that underlie the Walong to Marcel segment and Cliff Siding Extension are rated as Low Potential. A rating of Low Potential indicates that the subsurface geologic formations have a low or no potential to produce significant paleontological resources.



BNSF/UPRR Mojave Subdivision
Tehachapi Rail Improvement Project

Cut & Fill Geologic Map - Cliff Siding Extension

March 2013 | Figure 2.2-6



Sources: Geological Map Of Breckenridge Mtn. Cummings Mtn Quad, T.W. Dibblee, Jr.

0 2,000 Feet

Legend

- Communities
- Project Area Segment
- Cut Areas
- Fill Areas

Geology

Qa - Quaternary Sediments
Qls - Landslide rubble
P - Pegmatite
qd - Quartz diorite
ms/ml/mg - Metasedimentary rocks

BNSF/UPRR Mojave Subdivision
Tehachapi Rail Improvement Project

Cut & Fill Geologic Map - Walong to Marcel

March 2013 | Figure 2.2-7

Reduced-Segment Alternative

Under the Reduced-Segment Alternative, the Cliff Siding Extension would not be built. Because no sensitive paleontological resources were identified within this segment, impacts related to paleontological resources would be the same as those under the Build Alternative.

No-Build Alternative

If the No-Build Alternative were selected, none of the geologic units would be disturbed; therefore, no impact to paleontological resources would occur.

Avoidance, Minimization, and/or Mitigation Measures

No substantial impacts are expected to occur and therefore no mitigation is required.

2.2.5 Hazardous Waste or Materials

Regulatory Setting

Hazardous materials including hazardous substances and wastes are regulated by many state and federal laws. Statutes govern the generation, treatment, storage and disposal of hazardous materials, substances, and waste, and also the investigation and mitigation of waste releases, air and water quality, human health and land use.

The primary federal laws regulating hazardous wastes/materials are the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA) and the Resource Conservation and Recovery Act of 1976 (RCRA). The purpose of CERCLA, often referred to as "Superfund," is to identify and clean up abandoned contaminated sites so that public health and welfare are not compromised. The RCRA provides for "cradle to grave" regulation of hazardous waste generated by operating entities. Other federal laws include:

- Community Environmental Response Facilitation Act (CERFA) of 1992
- Clean Water Act
- Clean Air Act
- Safe Drinking Water Act
- Occupational Safety and Health Act (OSHA)
- Atomic Energy Act
- Toxic Substances Control Act (TSCA)

- Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

In addition to the acts listed above, Executive Order (EO) 12088, *Federal Compliance with Pollution Control Standards*, mandates that necessary actions be taken to prevent and control environmental pollution when federal activities or federal facilities are involved.

California regulates hazardous materials, waste, and substances under the authority of the CA Health and Safety Code and is also authorized by the federal government to implement RCRA in the state. California law also addresses specific handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning of hazardous waste. The Porter-Cologne Water Quality Control Act also restricts disposal of wastes and requires clean-up of wastes that are below hazardous waste concentrations but could impact ground and surface water quality. California regulations that address waste management and prevention and clean-up of contamination include Title 22 Division 4.5 Environmental Health Standards for the Management of Hazardous Waste, Title 23 Waters, and Title 27 Environmental Protection.

Worker and public health and safety are key issues when addressing hazardous materials that may affect human health and the environment. Proper management and disposal of hazardous material is vital if it is found, disturbed, or generated during project construction.

Affected Environment

A Hazardous Materials and Wastes Investigation was completed for the project in March 2013 and has been included with the Combined Technical Reports document of this environmental impact report (Appendix D).

Normal rail operations include the use of hazardous materials, such as oils, solvents, and other petroleum products. Hazardous materials and petroleum products are not currently stored in reportable quantities in the project area. However, the cleanup of any minor spills or releases of these products is part of normal operations.

The project is not located on sites that are included on a list of hazardous materials sites per Government Code Section 65962.5. The project is not located within an airport land use plan or near a public airport, public use airport facility, or private airstrip. The project is located within the limits of an existing railroad right-of-way alignment, except for small portions of land currently used for agricultural purposes; therefore, impacts to

emergency response plans adopted by the County of Kern or other agencies would not be expected as a result of project implementation.

Hazardous materials and petroleum products are transported as freight on the Union Pacific Railroad right-of-way. Consequently, there is a risk of spillage of hazardous materials and petroleum products in the project vicinity, including adjacent wildland areas, during operational use. Natural disasters within the project area, such as fires, landslides or earthquakes, have the potential to result in the release of hazardous materials and/or petroleum products from ruptures in the wayside oiler system or a train derailment.

Wayside Oilers

In the project area are devices known as "wayside oilers," where a film of grease or other lubricant is placed between the flanges of locomotive or railcar wheels and the inside of the rail head. Wayside oilers are located several feet before a curve in the track and are used to extend the life of the train wheels and the rail by reducing friction generated by trains navigating curves in the railroad track. The wheels of the car help to further spread the mixture down the track. These devices consist of a tank (of various capacities up to 100 gallons) that contains a mix of oil and graphite that, when triggered by the rail car, is dispensed to the rail and wheels of the car.

Historically, railroads are known to have used waste oil as a lubricant in the wayside oilers. Currently, all wayside oilers on railroad tracks through the Tehachapi Pass have liners installed beneath them to prevent leaks from migrating into surrounding soils. Some degree of dispersion by rolling stock onto the ballast is expected with the use of these devices. The highly viscous nature of the oil and graphite mixture used in the wayside oilers suggests that releases or accumulated lubricant would be confined to shallow soils in the local area and would not result in large amount of contamination.

Under current conditions, contamination caused by wayside oilers is generally localized under current operations to near ballast surface soils near the track.

Regulatory Database Findings

Information gathered from environmental databases was used to evaluate whether activities on or near the subject property have the potential to create adverse environmental impacts on the site. The information from the databases did not indicate that the use of hazardous materials at these locations has a potential to affect the project

area (no release into the project area). Based on the regulatory status and/or distance from the subject property relative to the direction of groundwater flow in the area, potential for the other listed facilities to create an environmental concern in the project area is considered moderate to low.

Reported Spills

One area within the project area has a known prior spill due to a train derailment in 2007. According to the information provided by BNSF, this event was appropriately mitigated in accordance with all applicable laws, and the case is now closed. Therefore, this event would not constitute a potential impact for the project. A summary of this incident is presented in Table 2.2-3. Additionally, the environmental database review did not identify spills within the project area. However, there is a possibility that unreported releases from UPRR within the project area may exist due to the long history of the right-of-way use. If any such unreported releases are discovered, they will be mitigated according to measures identified in the System Hazardous Materials Emergency Response Plan.

Table 2.2-3 Spills or Releases in the Mojave Subdivision

Environmental Releases between Mile Posts 327.85 and 353.08 – Proposed Mojave Subdivision				
Date	**Station**	**Mile Post**	**Description**	**Comments**
11/17/2007	Cliff	343.4	24 cars containing 7 HAZMAT containers derailed at Tunnel 7. Agricultural sulfur, fire retardant, cyclohexanone, and petroleum products (lube oil, antifreeze, and grease) were spilled.	39.64 tons of Non-Resource Conservation and Recovery Act petroleum-affected soil was removed. Confirmation sampling confirmed cyclohexanone and ethylene glycol were excavated and removed from the Site under the oversight of Kern County Department of Environmental Health.

Source: BNSF, 2009

Hazards

Hazardous Materials Transport

According to the Association of American Railroads, about 6 percent of the total freight rail traffic is made up of hazardous materials; virtually all shipments arrive at their destination without a release caused by an accident. Technical improvements have substantially reduced the likelihood of accidental hazardous material releases.

The overall hazardous material accident rate on Class I railroads has declined by 90 percent since 1980 and 49 percent since 1990. Accident frequency rates for BNSF at a national level mirror the industry improvement in safety performance.

Wells

Records show that no wells are located near the project area.

Polychlorinated Biphenyls (PCBs)

Due to the age of the rail lines in the area, there is the potential for Polychlorinated Biphenyls (known as PCBs) to exist onsite. Historically, PCBs were used in electrical transformers which may have been located on pads or poles. However, there was no evidence of transformers observed onsite.

Storage Tanks

An above-ground storage tank was seen near the Walong to Marcel segment of the project. The tank design was consistent with a water tank.

Asbestos and Lead

The project does not involve the demolition of any buildings or structures, therefore, the potential presence of asbestos and lead is not a concern. However, two 6-inch-diameter broken metal pipes covered with a plastic-like material, which may have asbestos-containing materials, were seen within the Walong to Marcel segment.

Weed Abatement and Herbicides

UPRR contracts out weed and herbicide spraying practices. Contractors are selected based on a proven track record of environmental responsibility. They are required to comply with all necessary licensing, permits and certifications for the area they are working in and with manufacturers' label requirements for products used. The application of pesticides and herbicides comply with laws for application and manufacturer's label requirements. Herbicide is not applied directly to water bodies or to areas where surface water is present, or to intertidal areas below the high water mark.

Blasting Activity

Very competent crystalline bedrock outcrops have been seen in a limited portion of the project area. Depending on the rippability of these sections, blasting may be required to excavate the cuts required by the design. Blasting activity would likely occur within

rural, isolated sections of the two project segments. If blasting is required as part of the grading activities, the hazardous materials impacts associated with blasting would be mitigated through compliance with local and state laws.

Other Hazards

The California Department of Forestry identifies the degree of fire risks based on the severity of the fire hazard that is expected to prevail. Fire zones are identified based on factors such as fuel (material that can burn), slope and fire weather. Fire Hazard Severity Zone Maps developed by the California Department of Forestry show that most of the project area is within fire-prone areas. The two project segments, Cliff Siding Extension and Walong to Marcel, are located in woodland areas classified as Fire Hazard Severity Zones.

The project is not located within any other areas that would pose a safety hazard. In addition, the Walong to Marcel segment is at least 6 miles northwest of the Tehachapi Airport, and the Cliff Siding Extension is over 10 miles northwest of the Tehachapi Airport. As a result, neither segment is within the Airport's Land Use Compatibility Plan. Record searches also indicated that there were no private airstrips within the vicinity of the two project segments. In addition, the nearest school is about 2 miles from the project site, and other sensitive receptors are more than 4 miles from the project site.

Environmental Consequences

Build Alternative

Construction Impacts

Hazardous Materials

Project construction may require the excavation of areas with known or previously undiscovered contamination, although the project segments are not included on a list of hazardous materials sites per Government Code Section 65962.5. Excavation necessary for embankment construction near reported spill sites and wayside oilers may result in the need for removal of potentially contaminated material. Potentially contaminated material is expected to be visibly recognizable. If contamination is encountered, it would be addressed according to applicable state and federal regulations. Areas with known spill sites and areas where stain or odiferous soils are encountered would be monitored by the Environmental Site Monitor during project implementation. During construction activities, identification and removal of potentially contaminated materials, which may be

indirectly adversely affecting local flora and fauna, may result in minor beneficial impacts to the project area.

Based on the geology assessment and the Geology Hazards and Soils Technical Report, the project may require the focused use of explosives to fracture bedrock outcroppings. During initial investigations, a visual survey identified general areas where the use of explosives to fracture rock may be required to achieve the project goals. However, this visual survey did not specifically pinpoint those areas, nor did it determine the specific rock quality index in locations that may require the use of explosives during excavation. A final geotechnical investigation shall be completed before construction, and its findings and recommendations would be incorporated into the final construction design plans and specifications. This investigation would identify the extent and locations of where controlled blasting would occur.

Although explosives may be used in some bedrock areas, the actual conditions created as a result of this focused blasting activity would be low-level sound and minor ground vibration, with no flying debris and material. The intent of blasting is to fracture bedrock material so that grading equipment can move material as they form the permanent way of the track. Blasting activities are highly technical and controlled, and would occur along isolated portions of the site; accordingly no adverse impacts to surrounding areas would occur as a result of these activities.

Operational Impacts

Hazardous Materials

Operation under the implementation of the Build Alternative would increase the amount of hazardous materials being transported through the Tehachapi Trade Corridor, which result in a proportional increase of hazardous materials being transported in the railroad right-of-way. However, technological improvements have substantially reduced the likelihood of accidental hazardous material releases along railway corridors and substantially eliminated the risk of releasing hazardous materials into the environment.

Other Hazards

The site is not within an airport land use plan, nor is it within the vicinity of a private airstrip or public airport. In addition, the proposed double-tracking would be about 2 miles from a school, and therefore would not emit hazardous emissions or handle hazardous materials within one-quarter-mile of a school. In addition, the double-tracking

would be located within the railroad right-of-way and would not interfere with any adopted emergency response or evacuation plans. While the project is next to fire-prone wildlands, continued operation of the railway would not expose people or structures to any additional risk to wildland fires. No impacts would occur during the operation of the project.

Reduced-Segment Alternative

The Reduced-Segment Alternative involves double-tracking only the Walong to Marcel segment. As addressed previously, all potential hazardous materials that were addressed for the project were applicable to this segment, and as a consequence, conditions for this alternative would be the same as the Build Alternative. Impacts, as well as the suggested minimization measures, would continue to be the same with this alternative.

No-Build Alternative

Construction and Operational Impacts

Under the No-Build Alternative, the project would not be built through the project area. No contaminated material would be exposed, and potential beneficial impacts from disposal of excavated potentially contaminated material would not be realized. Operational activities under this alternative would remain as they are now; therefore, no new impacts or mitigation measures would be expected.

Avoidance, Minimization, and/or Mitigation Measures

The following Mitigation Measures have been incorporated to ensure that substantial impacts in this issue area are mitigated to a less than significant level:

- A Preliminary Site Investigation shall be conducted to identify potentially contaminated materials within the project segments before construction.
- During project construction, the railroads would retain the service of an on-call, qualified professional industrial hygiene firm to support the Environmental Site Monitor to monitor grading activities.
- If any hazardous materials or contamination are found during excavation, all work would be halted in the affected area until a qualified hazmat consultant, such as a Registered Environmental Assessor or a Registered Geologist, makes a determination as to the scope and extent of the contamination. If contamination is limited, remediation of the site would be conducted by a licensed contractor in accordance with state and local guidelines. If the scope of the contamination is

considered extensive, the developer would contact the state Department of Toxic Substances Control to determine the appropriate form of remediation, which may include the developer entering into a Voluntary Work Plan (VWP). The hazmat consultant shall file a final report to the Caltrans upon completion of remediation activities.

- All construction- and maintenance-related activities occurring at the project will complete the following:
- Construction personnel shall ensure that waste, including trash and litter, garbage, other solid waste, petroleum products, and other potential hazardous materials, would be properly handled by the railroads' construction personnel in accordance with state and federal regulations and permit requirements and removed from the site to a permitted disposal facility. All trash containers would have sealed and secured lids.
- The railroad construction personnel shall be responsible to ensure all major equipment maintenance and vehicle fueling within the construction area would occur within a lined containment area to prevent release to the surrounding environment.
- A Fire Suppression Management Plan shall be prepared by the railroad's contractor(s) and approved by County Fire Department before beginning earth-moving activities. The plan would outline the procedures to be followed to prevent accidental fire from construction activities. The plan would contain a chain of command, contact information (including fire departments), and location and placement of fire suppression equipment such as water trucks and fire extinguishers. Monitoring contractor compliance with the Fire Suppression Management Plan would be the responsibility of the Environmental Site Monitor present onsite during grading activities and retained by the project proponent before construction.
- The railroads shall prepare a Construction Emergency Response Plan to be approved by County Fire Department before beginning work and implemented by the railroads' contractor(s) during construction activities.
- Blasting activity would likely occur in the two segments of the project. To remediate impacts from the blasting activity, the railroads would implement the following minimization measures:
- Before beginning construction activities, the railroads would retain the services of a blasting contractor licensed to use Class A explosives, and licensed as a

contractor in the State of California, to conduct any blasting required for project construction. The contractor would comply with all applicable regulations and standards established by the regulatory agencies, codes, and professional societies including the rules and regulations for storage, transportation, delivery, and use of explosives. Compliance with California Code of Regulations, Title 8 (Division of Occupational Safety and Health - Cal/OSHA).

- In addition to these basic requirements, a blasting plan may be required by Caltrans or the County of Kern Building Department to address specific mitigation measures on a site-impact-specific basis. A blasting plan is intended to help ensure worker safety and the protection of natural, historic and cultural resources. Other requirements or restrictions may apply based on regulatory review. Elements of a blasting plan would include the following:
    - Description of the procedures to be implemented to protect workers during blasting
    - Description of the procedures for proper storage and transportation of explosive materials
    - Prohibition of blasting during extreme fire danger periods
    - Description of the procedures to prevent impact to biological resources
    - Detailed procedures to ensure that flyrock, air blast, and ground vibration are controlled
    - Procedures to protect existing facilities and utility lines
    - Procedures for notifications to local residents and businesses near blast areas
- BNSF would continue to maintain current operating rules and procedures during project construction and operation, as well as the current System Hazardous Materials Emergency Response Plan, to reduce the risk of an accident and to minimize the potential risk of exposure to hazardous materials. In addition, the railroads would continue to use their current procedures for weed abatement during construction and operation to ensure that all waterway, bridges, etc. are buffered to comply with laws for pesticide application and manufacturer's label requirements, and that herbicide would not be applied directly to water or to areas where surface water is present.

2.2.6 Air Quality

Regulatory Setting

Federal

The Federal Clean Air Act (FCAA), as amended, is the primary federal law that governs air quality while the California Clean Air Act is its companion state law. These laws, and related regulations by the United States Environmental Protection Agency (U.S. EPA) and the California Air Resources Board (ARB), set standards for the concentration of pollutants in the air. At the federal level, these standards are called National Ambient Air Quality Standards (NAAQS). NAAQS and state ambient air quality standards have been established for six transportation-related criteria pollutants that have been linked to potential health concerns: carbon monoxide (CO), nitrogen dioxide (NO2), ozone (O3), particulate matter (PM), which is broken down for regulatory purposes into particles of 10 micrometers or smaller (PM10) and particles of 2.5 micrometers and smaller (PM2.5), and sulfur dioxide (SO2). In addition, national and state standards exist for lead (Pb), and state standards exist for visibility reducing particles, sulfates, hydrogen sulfide (H2S), and vinyl chloride. The NAAQS and state standards are set at levels that protect public health with a margin of safety, and are subject to periodic review and revision. Both state and federal regulatory schemes also cover toxic air contaminants (air toxics); some criteria pollutants are also air toxics or may include certain air toxics in their general definition.

Federal air quality standards and regulations provide the basic scheme for project-level air quality analysis under the National Environmental Policy Act. In addition to this environmental analysis, a parallel "Conformity" requirement under the Federal Clean Air Act also applies.

Affected Environment

An Air Quality Study Report was completed in May 2013 for this project and has been attached in the Combined Technical Reports document of this environmental impact report (Appendix D).

The project is located within the Tehachapi Pass, which serves as a major route for trucks, passenger vehicles and trains to access areas north and south of the pass. Tehachapi Pass sits within both the Mojave Desert Air Basin and the San Joaquin Valley Air Basin.

The terrain in this area gradually ascends from the southern end of the Tehachapi Pass (Marcel) to the top of the Tehachapi Pass (Bena). The project site is rural, with a small population and a small number of residences in the general area.

Due to the altitude and the weather, daily temperatures can vary greatly. The monthly average temperatures recorded between 1971 and 2000 at the Tehachapi weather station ranged from 40.5 degrees Fahrenheit in January to 72.1 degrees Fahrenheit in July. The annual average temperature for this station was 54.3 degrees Fahrenheit. December, January, and February are typically the coldest months. Winds in the vicinity of the project area blow predominantly from the west to southwesterly in the valley, with relatively low velocities averaging about 4 miles per hour for the year and gusting up to 17 miles per hour. Most of the annual rainfall in the project area occurs between December and March. Rainfall averages about 11 inches a year in Tehachapi; the area gets almost 19 inches of snowfall in winter.

Table 2.2-4 provides state and federal ambient air quality standards as well as the attainment status for both air basins.

Table 2.2-5 provides air pollutant concentrations from the nearest monitoring stations.

Table 2.2-4 State and Federal Ambient Air Standards and Attainment Status for San Joaquin and Mojave Desert Air Basins

Pollutant	Averaging Time	State Standard[1]	Federal Standard[1]	Principal Health and Atmospheric Effects	Typical Sources	Attainment Status	
						San Joaquin[2]	Mojave Desert
Ozone (O_3)[2]	1 hour	0.09 ppm		High concentrations irritate lungs. Long-term exposure may cause lung tissue damage and cancer. Long-term exposure damages plant materials and reduces crop productivity. Precursor organic compounds include many known toxic air contaminants. Biogenic VOC may also contribute.	Low-altitude ozone is almost entirely formed from reactive organic gases/volatile organic compounds (ROG or VOC) and nitrogen oxides (NOx) in the presence of sunlight and heat. Major sources include motor vehicles and other mobile sources, solvent evaporation, and industrial and other combustion processes.	no federal standard state: nonattainment-severe	federal: attainment -/maintenance state: nonattainment-moderate
Ozone (O_3)[2]	8 hours	0.070 ppm	0.075 ppm[6]			federal: nonattainment-extreme, state: not yet classified	federal: nonattainment state: not yet classified
Carbon Monoxide (CO)	1 hour 8 hours	20 ppm 9.0 ppm	35 ppm 9 ppm[1]	CO interferes with the transfer of oxygen to the blood and deprives sensitive tissues of oxygen. CO also is a minor precursor for photochemical ozone.	Combustion sources, especially gasoline-powered engines and motor vehicles. CO is the traditional signature pollutant for on-road mobile sources at the local and neighborhood scale.	federal: unclassified/Attainment state: attainment	federal: unclassified/Attainment state: attainment
Respirable Particulate Matter (PM10)[2]	24 hours/ Annual Arithmetic Mean	50 μg/m3 20 μg/m3	150 μg/m3	Irritates eyes and respiratory tract. Decreases lung capacity. Associated with increased cancer and mortality. Contributes to haze and reduced visibility. Includes some toxic air contaminants. Many aerosol and solid compounds are part of PM10.	Dust- and fume-producing industrial and agricultural operations; combustion smoke; atmospheric chemical reactions; construction and other dust-producing activities; unpaved road dust and re-entrained paved road dust; natural sources (wind-blown dust, ocean spray).	federal: attainment/maintenance state: nonattainment	federal: nonattainment state: unclassified
Fine Particulate Matter (PM2.5) [2]	24 hours - Annual	N/A 12 μg/m3	35 μg/m3--- 12 μg/m3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and produces surface soiling. Most diesel exhaust particulate matter – a toxic air contaminant – is in the PM2.5 size range. Many aerosol and solid compounds are part of PM2.5.	Combustion including motor vehicles, other mobile sources, and industrial activities; residential and agricultural burning; also formed through atmospheric chemical (including photochemical) reactions involving other pollutants including NOx, sulfur oxides (SOx), ammonia, and ROG.	federal: nonattainment state: nonattainment	federal: nonattainment state: unclassified
Nitrogen Dioxide (NO_2)	1 hour - Annual	0.18 ppm 0.030 ppm	0.100ppm[7] 0.053 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown. Contributes to acid rain. Part of the "NOx" group of ozone precursors.	Motor vehicles and other mobile sources; refineries; industrial operations.	federal: unclassified/Attainment state: attainment	federal: unclassified/Attainment state: attainment
Sulfur Dioxide (SO_2)	Annual 1 hour	NA 0.25 ppm	0.03 ppm 0.075 ppm	Irritates respiratory tract; injures lung tissue. Can yellow plant leaves. Destructive to marble, iron, steel. Contributes to acid rain. Limits visibility.	Fuel combustion (especially coal and high-sulfur oil), chemical plants, sulfur recovery plants, metal processing; some natural sources like active volcanoes. Limited contribution possible from heavy-duty diesel vehicles if ultra-low sulfur fuel not used.	federal: attainment state: attainment	federal: attainment state: attainment
Lead (Pb)[3]	Monthly Quarterly 3 month rolling average	1.5 μg/m3	N/A 1.5 μg/m3	Disturbs gastrointestinal system. Causes anemia, kidney disease, and neuromuscular and neurological dysfunction. Also a toxic air contaminant and water pollutant.	Lead-based industrial processes like battery production and smelters. Lead paint, leaded gasoline. Aerially deposited lead from gasoline may exist in soils along major roads.	federal: no designation state: attainment	federal: no designation state: attainment
Sulfate	24 hours	25 μg/m3	---	Premature mortality and respiratory effects. Contributes to acid rain. Some toxic air contaminants attach to sulfate aerosol particles.	Industrial processes, refineries and oil fields, mines, natural sources like volcanic areas, salt-covered dry lakes, and large sulfide rock areas.	federal: no standards state: unclassified	federal: no standards state: unclassified
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm	---	Colorless, flammable, poisonous. Respiratory irritant. Neurological damage and premature death. Headache, nausea.	Industrial processes such as: refineries and oil fields, asphalt plants, livestock operations, sewage treatment plants, and mines. Some natural sources like volcanic areas and hot springs.	federal: no standards state: unclassified	federal: no standards state: unclassified
Visibility Reducing Particles (VRP)	8 hours	Visibility of 10 miles or more	---	Reduces visibility. Produces haze.	See particulate matter above.	state only: unclassified	state only: unclassified
Vinyl Chloride	24 hours	0.01 ppm	---	Neurological effects, liver damage, cancer; is also considered a toxic air contaminant	Industrial processes	state only: unclassified	state only: unclassified

Notes:
[1]ARB, June 2012
[2]SJVAPCD http://www.valleyair.org/aqinfo/attainment.htm , accessed May 14, 2013.

Table 2.2-5 Ambient Air Quality at Air Monitoring Stations Closest to the Tehachapi Project Area

Calendar Year	Pollutant Concentrations																			
	CO[1]				O_3[2]				PM_{10}[1]				$PM_{2.5}$[3]				NO_2[2]			
	Max 1-hour (ppm)	Number of Days Exceeded	Max 8-hour (ppm)	Number of Days Exceeded	Max 1-hour (ppm)	Number of Days Exceeded	Max 8-hour (ppm)	Number of Days Exceeded	Max 24-hour (µg/m³)	Number of Days Exceeded	Max Annual (µg/m³)	Number of Days Exceeded	Max 24-hour (µg/m³)	Number of Days Exceeded	Max Annual (µg/m³)	Number of Days Exceeded	Max 1-hour (ppm)	Number of Days Exceeded	Max Annual (ppm)	Number of Days Exceeded
State Standards[4]	20 ppm / 1-hour		9 ppm / 8-hour		0.09 ppm / 1-hour		0.070 ppm / 8-hour		50 µg/m³ / 24-hour		20 µg/m³ / annual AM		--		12 µg/m³ / annual AM		0.18 ppm / 1-hour		0.030 ppm / annual AM	
2011	ND	ND	ND	ND	0.118	25	0.097	74	ND	ND	ND	ND	45.9	ND	14.4	ND	0.042	0	--	--
2010	ND	ND	1.46	0	0.125	36	0.102	68	38.6	ND	ND	ND	107.8	ND	ND	ND	0.048	0	--	--
2009	ND	ND	1.51	0	0.135	33	0.105	78	139.5	ND	ND	ND	167.7	ND	ND	ND	0.070	0	--	--
2008	2.5	0	2.17	0	0.137	55	0.113	105	266.8	ND	ND	ND	100.3	ND	ND	ND	0.098	0	--	--
2007	2.4	0	1.97	0	0.138	29	0.105	71	135	ND	ND	ND	90.7	ND	ND	ND	0.048	0	--	--
2006	3.9	0	2.19	0	0.141	51	0.122	90	162	166.8	56.5	ND	78.6	ND	ND	ND	0.066	0	--	--
2005	3	0	2.10	0	0.124	38	0.1	75	109	119.2	43.4	ND	77.5	ND	ND	ND	0.059	0	--	--
2004	3.8	0	2.60	0	0.136	45	0.108	96	84	113	43	ND	59.5	ND	ND	ND	0.053	0	--	--
Maximum	3.9		2.60		0.141		0.122		266.8		56.5		100.3				0.098		--	--
Federal Standards[5]	35 ppm / 1-hour		9 ppm / 8-hour		--		0.075 ppm / 8-hour		150 µg/m³ / 24-hour		--		35 µg/m³ / 24-hour		15 µg/m³ / annual AM		0.100 ppm / 1-hour		0.053 ppm / annual AM	
2011	ND	ND	ND	ND	0.118	0	0.097	47	ND	ND	ND	ND	45.9	22	14.4	ND	ND	ND	ND	ND
2010	ND	ND	1.34	0	0.125	1	0.102	44	36.8	0	ND	ND	107.8	ND	ND	ND	ND	ND	ND	ND
2009	ND	ND	1.51	0	0.135	2	0.105	60	138.2	0	ND	ND	167.7	50.5	ND	ND	ND	ND	ND	ND
2008	3.5	0	2.2	0	0.137	4	0.112	54	267	1	83	0	100.3	1	22.57	1	0.098	0	0.007	0
2007	2.8	0	2.0	0	0.138	1	0.104	44	172	1	55	0	90.7	1	21.78	1	0.048	0	0.010	0
2006	3.3	0	2.2	0	0.141	9	0.121	68	154	0	55	0	78.6	1	19.35	1	0.066	0	0.011	0
2005	3.2	0	2.1	0	0.124	0	0.1	55	107	0	43	0	77.5	1	19.82	1	0.059	0	0.012	0
2004	4.1	0	2.6	0	0.136	1	0.107	66	85	0	43	0	59.5	1	17.42	1	0.053	0	0.013	0
Maximum	4.1		2.6		0.141	9	0.121	68	267	1	83		167.7	1	22.57	1	0.098		0.013	

Notes: [1] CO and PM_{10}, data are from the Bakersfield-Golden State Highway monitoring station
[2] O_3 and NO_2 data are from the Edison monitoring station
[3] $PM_{2.5}$ data is from the Bakersfield-Planz Road monitoring station
[4] Source: California Air Resources Board, 2006b
[5] Source: EPA, 2006a
AM - Arithmetic Mean
ND – No data available from California Air Resources Board or EPA

Environmental Consequences

Results of the air quality analysis are provided below and show that the Build Alternative and Reduced-Segment Alternative would result in a net benefit to air quality.

The analysis of the Build Alternative versus existing conditions found that there would be additional locomotive emissions under existing conditions due to an increase in the average number of locomotive engines even without the project. The Build Alternative would have the most locomotive emissions compared to the Reduced-Segment Alternative and the No-Build Alternative. But, the Build Alternative would also provide the greatest savings in overall emissions by transporting freight by rail as compared to truck. Compared to trains, trucks were found to result in more air pollutant emissions for moving the same amount of freight. So, the longer trains allowed under the Build Alternative would result in lower emissions compared to the pollutants that would otherwise be emitted by trucks.

Other benefits to regional air quality include the following:

- Improvements in operational efficiency to decrease train idling for trains traveling through the Tehachapi Pass
- Movement of freight with fewer emissions by train as opposed to trucks
- Reduction in traffic congestion on highways and its emissions on roadways by moving freight by train as opposed to trucks
- Reduction of emissions associated with roadway repair due to trucks

A localized air impact analysis was done at the National Chavez Center because it is the major sensitive receptor in the project area. Despite the projected 40-train-per-day future condition, 56 trains were used for the assessment to provide the most conservative analysis and represent an infrequent peak number of trains that could occur under the Build Alternative. Results of the analysis found that under all three alternatives, emissions were below the U.S. Environmental Protection Agency's health standards and would not result in a health impact to visitors or residents at the National Chavez Center or any other sensitive receptor in the project vicinity.

Methodology and Evaluation Criteria

The regional air quality analysis took into account the following evaluation criteria, which are necessary to discuss the total benefits and impacts in the context of transportation infrastructure and network projects. Transportation projects are different from typical land development projects because they are built to meet future transportation demands. The demand for freight movement will continue to increase and would need to be met by either trains or trucks. Accordingly, this project requires evaluation under these criteria:

- Whether the project results in a net environmental benefit to the State of California due to a reduction in criteria pollutants and greenhouse gas emissions
- Improvements in operational efficiencies
- Direct emission benefits of trains, which emit fewer emissions than trucks per unit of freight moved
- Train traffic congestion relief
- Road traffic reduction (trucks removed from the road)
- Reduced road destruction by removing trucks from highways

The Caltrans evaluation of effects considers the cumulative net benefit of a project on emission related to trucks versus train, idling, train and traffic flow improvements, etc. As a reference in the evaluation of effects, California Environmental Quality Act Guidelines Appendix G was considered, and the related significance thresholds adopted by the San Joaquin Valley Air Pollution Control District or Eastern Kern Air Pollution Control District are included in the Air Quality Study Report (for reference only).

The analysis provides an assessment of potential construction and operational air quality impacts at both a local and regional scale.

At the local scale, the analysis examines whether the additional trains associated with the Build Alternative would negatively affect human health at the National Chavez Center and would not contribute toward exceeding the ambient air quality standards within the air basin.

On a regional scale, all three alternatives were evaluated with the following components:

- Build and Reduced-Segment Alternatives versus existing conditions
- Build and Reduced-Segment Alternatives compared to each other
- Build and No-Build Alternatives compared to each other
- Train versus truck emissions

Alternatives Analysis

The Air Quality Assessment used the following method to compare alternatives (see Table 2.2-6) and their respective estimated air emissions:

Table 2.2-6 Train Quantities by Alternatives

Trains	Existing Condition			Future (No-Build)			Future (Reduced Segment)				Future (With Project)			
	Existing Average	Existing Peak (Max Rail Capacity Without Project)	Trucks on SR-58	Future Average (2015) Without Project	Future Peak (2015) Without Project[1]	Trucks on SR-58	Future Average (2015)	Future Peak (2015)	Max Track Capacity	Trucks on SR-58	Future Average (2015) With Project	Future Peak (2015) With Project	Max Track Capacity (With Project)	Trucks on SR-58
6,000-foot trains [2.]	33	48		38	52		34	48	48		28	42	44	
8,000-foot trains [3.]	2	2		2	2		6	6	6		12	12	12	
Total Number of Trains	35	50		40	54		40	54	54		40	54	56	
Containers from 6,000 ft. Trains	7,425	10,800		8,550	10,800		7,650	10,800	10,800		6,300	9,450	9,900	
Containers from 8,000-foot Trains	560	560		560	560		1,680	1,680	1,680		3,360	3,360	3,360	
Total Containers (Trucks)	7,985	11,360	8,729	9,110	11,360	9,212	9,330	12,480	12,480	9,212	9,660	12,810	13,260	9,212

[1.] Note: Future without Project peak demand conditions cannot be accommodated by existing track configuration. Therefore freight that would be transported on a Future without Project peak day in excess of the 50-train capacity would have to be transported by truck.
[2.] A 6,000-foot train has 4 locomotives and 225 containers per train.
[3.] An 8,000-foot train has 5 locomotives and 280 containers per train.
Source: BNSF, 2012

Though the annual number for 2015 is projected to be 40 trains per day, the localized air pollution analysis at the Chavez Center evaluates train volumes that exceed the annual number of trains per day to provide the most conservative analysis. The daily worst-case train volume used in the localized air pollution analysis for the No-Build Alternative is 50 trains per day; the Reduced-Segment Alternative used 54 trains per day, and the Build Alternative used 56 trains per day (see Table 2.2-6).

Emissions inventories were also conducted for regional emissions that contribute to the basinwide air quality. The contribution of emissions from the future No-Build, Reduced-Segment and Build Alternatives to regionwide air quality was calculated based on average daily train volumes. For a comprehensive evaluation of the alternatives' air quality emissions, the following analyses were done:

- Evaluation of emissions from existing conditions with 35 trains (at two 8,000-foot with five locomotives each and 33 6,000-foot trains with four locomotives each) per day to future daily train count of 40 trains for future No-Build and Build Alternatives (Scenario 1-CEQA Evaluation).
- Comparison of emissions for 2015 alternatives, including the following:
- Build Alternative (40 trains per day: 12 8,000-foot trains with 5 locomotives each and 28 6,000-foot trains with 4 locomotives each) to No-Build Alternative (trains per day: 2 8,000-foot trains with 5 locomotives each and 38 6,000-foot trains with 4 locomotives each).
- Reduced-Segment Alternative (40 trains per day: six 8,000-foot trains with five locomotives each and 34 6,000-foot trains with four locomotives each) to No-Build Alternative (40 trains per day: two 8,000-foot trains with five locomotives each and 38 6,000-foot trains with four locomotives each).
- Comparison of emissions with different train and locomotive engine tier mix and the equivalent number of trucks (280=1 train) to move the same quantity of freight as the trains within the goods movement system.

The alternatives were evaluated for their emissions relative to existing conditions as well as to each other. An analysis of emissions generated by trucks and trains was done to compare emissions from those two modes of freight transport.

Future-Year (2015) Alternatives Emissions Compared to Existing Conditions

Table 2.2-7 shows the emissions that would occur for each of the alternatives. As shown in the table, there are net reductions of volatile organic compounds (VOC) and particulate matter (PM_{10} and $PM_{2.5}$) for all the alternatives compared to existing conditions. This is

due to air pollutant controls that are phased in over time as newer cleaner locomotives are introduced and older dirtier locomotives are either retired or repowered with cleaner engines and pollution controls. Emissions of carbon monoxide (CO), nitrogen oxides ($NO_{x)}$ and sulfur oxides (SO_x) would generally increase over existing conditions except for the 2020 no-project condition where there is a net reduction of nitrogen oxides (NO_x) compared to existing conditions. The increase in emissions for the No-Build Alternative over existing conditions is due to the expected growth in demand in freight transport that would occur assuming the project is not built.

Emissions in Table 2.2-7 show only those generated from freight transport from trains and not emissions that would occur from meeting the total future freight demand. The project would result in fewer emissions than the No-Build Alternative.

Table 2.2-7 Baseline and 2015 Operational Emissions for the Alternatives

Analysis Year	Criteria Pollutants (tons/year)					
	VOC	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2
Project Emissions Above Baseline						
Year 2012 35 Trains (Baseline)	21	74	399	11.3	11.2	0.3
Year 2015 40 Trains (Existing + Project Trains)	20	89	433	11.4	11.3	0.4
Year 2015 Project Increase from Baseline	-1	16	34	0.1	0.1	0.1
Reduced-Segment Alternative Emissions Above Baseline						
Year 2012 35 Trains (Baseline)	21	74	399	11.3	11.2	0.3
Year 2015 40 Trains (Existing + Reduced Segment Trains)	19	86	417	11.0	10.9	0.4
Year 2015 Reduced Segment Increase from Baseline	-1	13	19	-0.3	-0.3	0.1
No-Build Alternative Emissions Above Baseline						
Year 2012 35 Trains (Baseline)	21	74	399	11.3	11.2	0.3
Year 2015 40 Trains (Existing + No Project Trains)	19	84	408	10.8	10.6	0.4
Year 2015 No Project Increase from Baseline	-2	11	10	-0.6	-0.6	0.0

Future-Year Alternatives Analysis Comparisons

Table 2.2-8 shows the magnitude of emissions that would occur based on the differences in the number of locomotive engines for each of the three alternatives. As shown in the table, the difference in emissions is attributable to the increase in number of locomotives.

The largest increase in future emissions occurs with the Build Alternative compared to the No-Build Alternative. This is due to the increase in locomotive engines (from 4 to 5 locomotives) per train that would occur under the Build Alternative. The five locomotives would be required to pull the longer 8,000-foot trains. The increase in emissions due to the Build Alternative over the No-Build Alternative is estimated to be between generally 6-7 percent. This increase in emissions due to the project is not considered large and would allow an additional 550 containers to be transported by trains as opposed to trucks, which generate more pollution.

Table 2.2-8 2015 Operational Emissions for the Alternatives

Analysis Year	Criteria Pollutants (tons/year)					
	VOC	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2
Project Emissions Above the No-Project Alternative						
Year 2015 No-Build Alternative (Baseline + No Project Trains)	19	84	408	10.8	10.6	0.4
Year 2015 Build Alternative (Baseline + Project Trains)	20	89	433	11.4	11.3	0.4
Increase due to Project	1	5	24	0.6	0.6	0.0
Project Emissions Above the Reduced-Segment Alternative						
Year 2015 50 Trains and 4.5 Locomotive Engines (Baseline + Reduced Segment Trains)	43	304	1,131	26.3	26.0	1.3
Year 2015 50 Trains and 5 Locomotive Engines (Baseline + Project Trains)	48	338	1,257	29.2	28.9	1.4
Increase due to Project	5	34	126	2.9	2.9	0.1
Reduced Segment Alternative Emissions Above the No-Project Alternative						
Year 2015 50 Trains and 4 Locomotive Engines (Baseline + No Project Trains)	38	270	1,006	23.4	23.1	1.2
Year 2015 50 Trains and 4.5 Locomotive Engines (Baseline + Reduced Segment Trains)	43	304	1,131	26.3	26.0	1.3
Increase due to Reduced Segment Alternative	5	34	125	2.9	2.9	0.1

Truck versus Train Comparison

If the Build Alternative is not built, train transport along the existing Tehachapi Pass would reach its capacity of 50 trains per day. The project would increase the rail system's capacity by allowing more trains, specifically a greater number of 8,000-foot trains, which would enable an additional 550 containers to be transported by rail rather than by truck.

The emissions for trains and trucks are presented for the year 2015 (build-out) as shown in Table 2.2-9. A travel distance of 500 miles was used in this analysis, which represents the distance at which trains are typically selected over trucks for freight transport. When train and trucks are transporting an equal quantity of freight, train emissions were found to be lower than truck emissions for all the analyzed air pollutants. As shown in Table 2.2-9 and Figure 2.2-8 through Figure 2.2-13, transport of freight by train results in a reduction in air pollution as compared to transport of the same quantity of freight by truck. This percent reduction in air pollution is the potential that could be achieved if freight demand exceeds the freight capacity under the current track configuration and the additional freight transport demand is met by the development of the project. While the Build Alternative would result in greater amounts of locomotive emissions compared to the No-Build Alternative, this increase in emissions would be offset and reduced if freight were being transported by train as opposed to the same quantity of materials being transported by truck.

Table 2.2-9 Estimated Emissions for Trains and Trucks

Analysis Year	Criteria Pollutants (in pounds)					
	VOC	CO	NO_x	PM_{10}	$PM_{2.5}$	SO_2
Trucks Emissions	179	812	5,462	140	96	5
Train Emissions	106	468	2,269	60	59	2
Emissions Reductions for Trains	41%	42%	58%	57%	38%	59%

Source: Conducted by URS, 2013

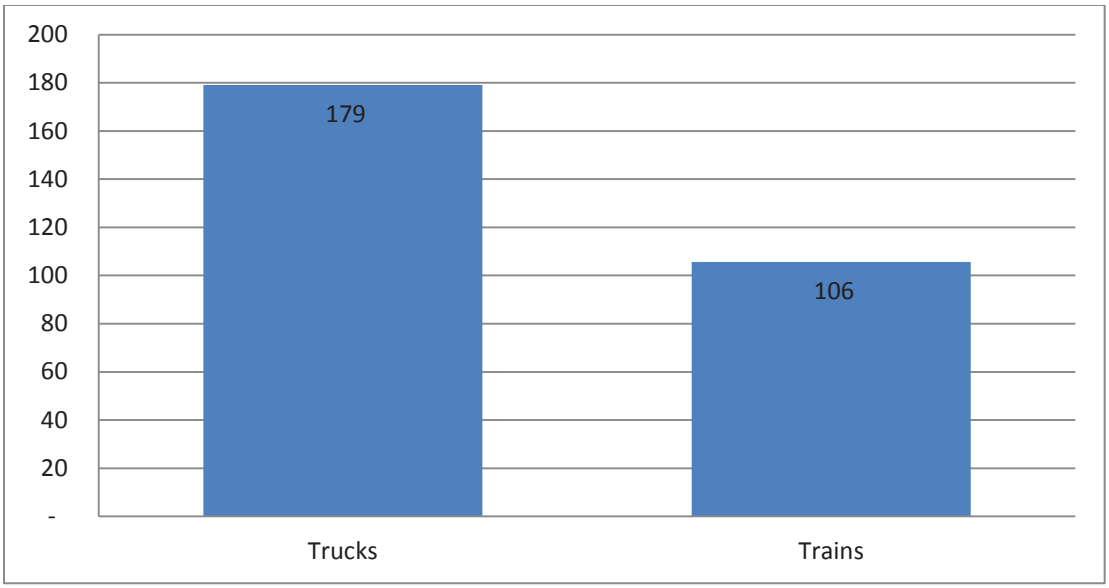


Figure 2.2-8 Comparison of Truck and Train ROG Emissions (pounds per day)

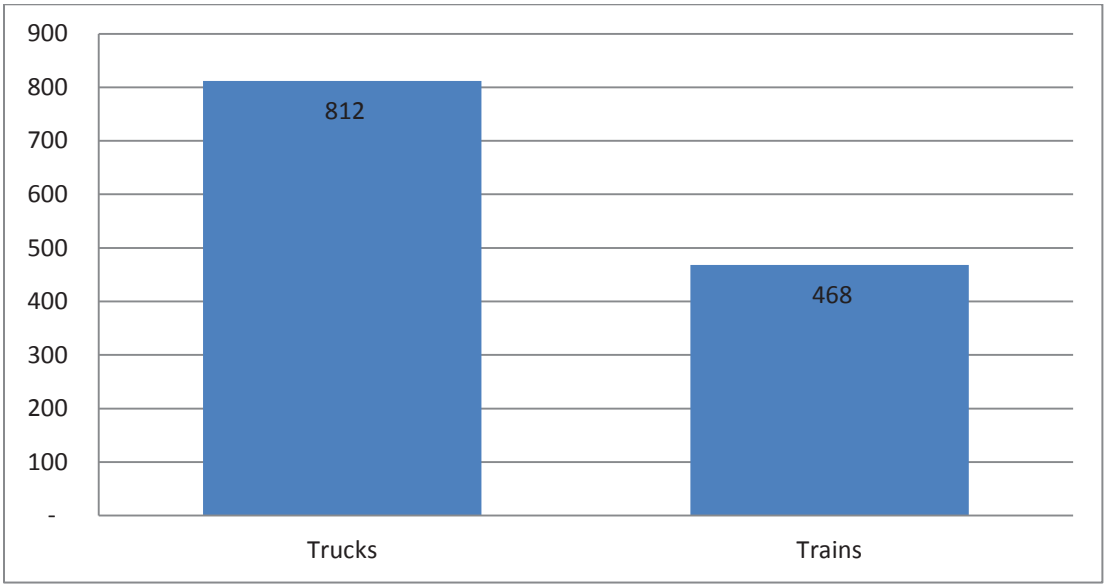


Figure 2.2-9 Comparison of Truck and Train CO Emissions (pounds per day)

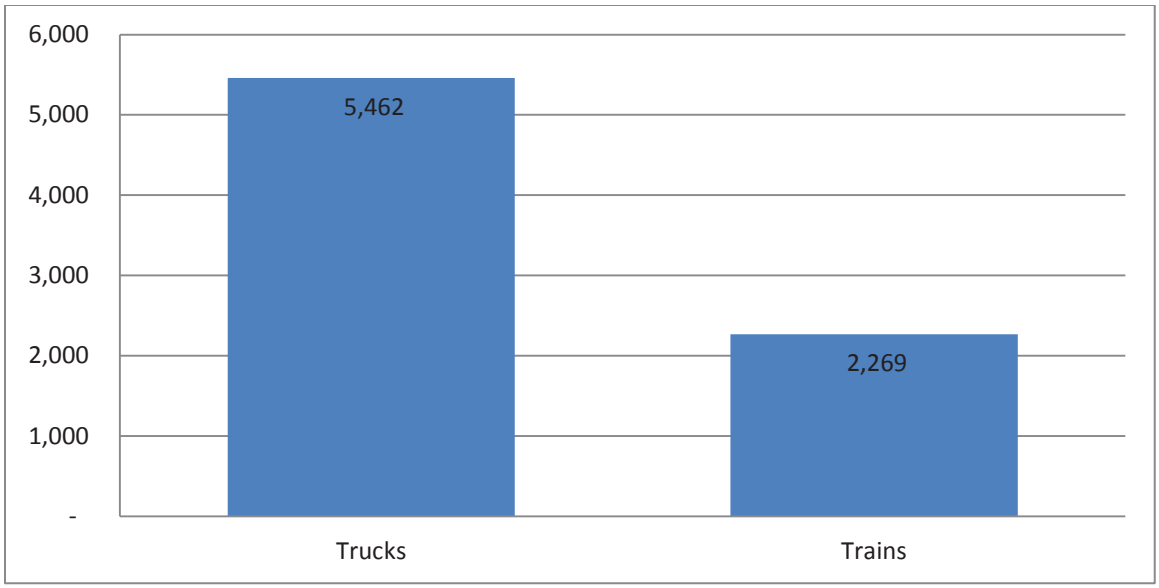


Figure 2.2-10 Comparison of Truck and Train NO_x Emissions (pounds per day)

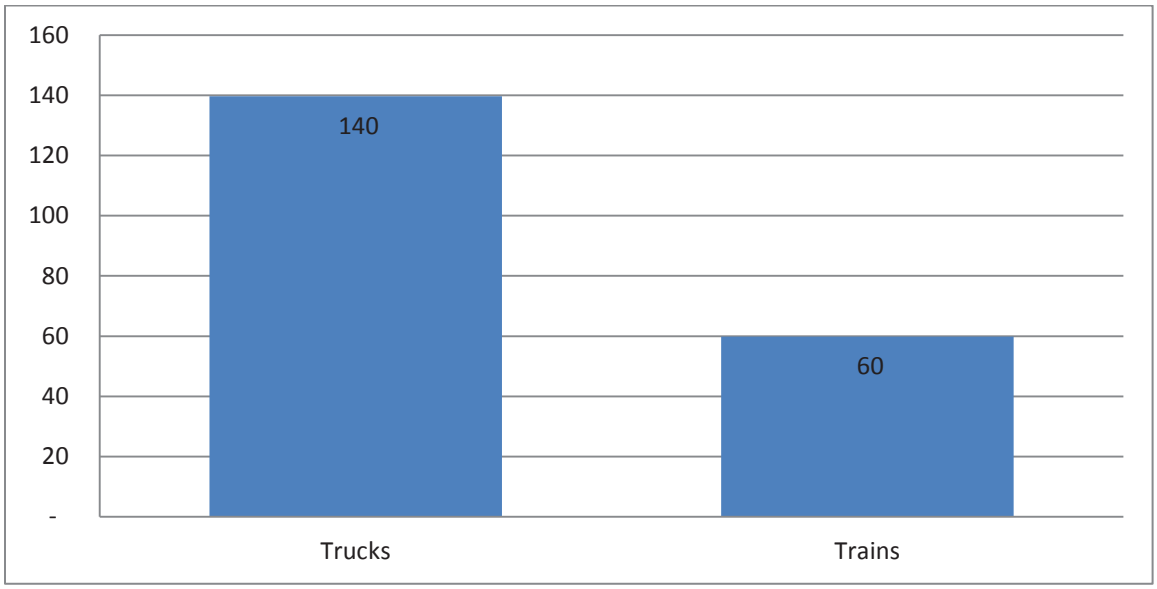


Figure 2.2-11 Comparison of Truck and Train PM_{10} Emissions (pounds per day)

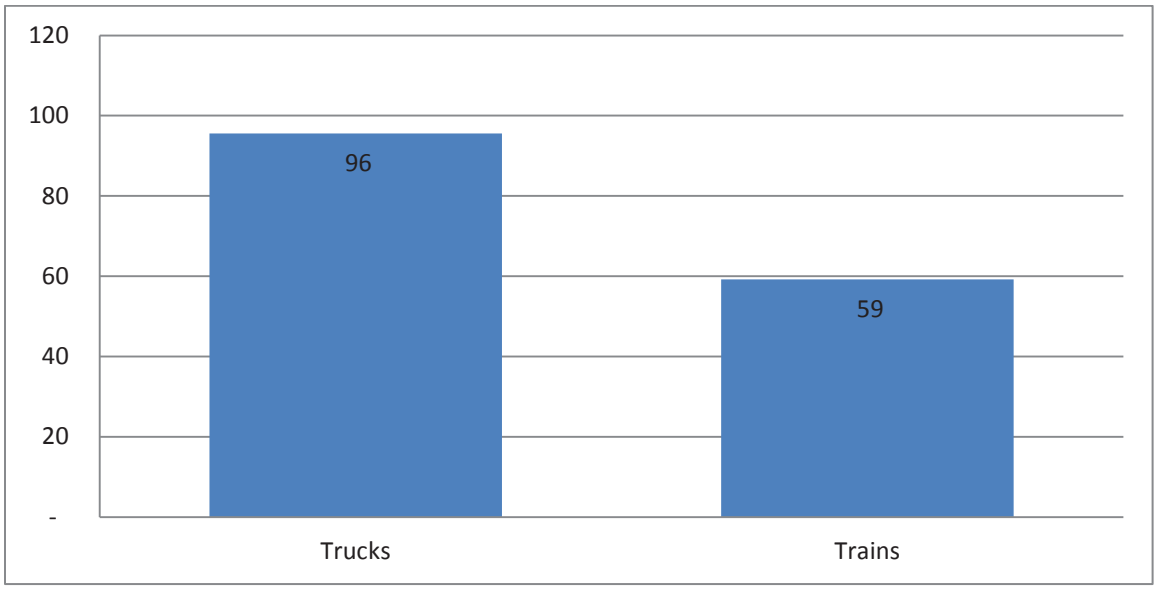


Figure 2.2-12 Comparison of Truck and Train $PM_{2.5}$ Emissions (pounds per day)

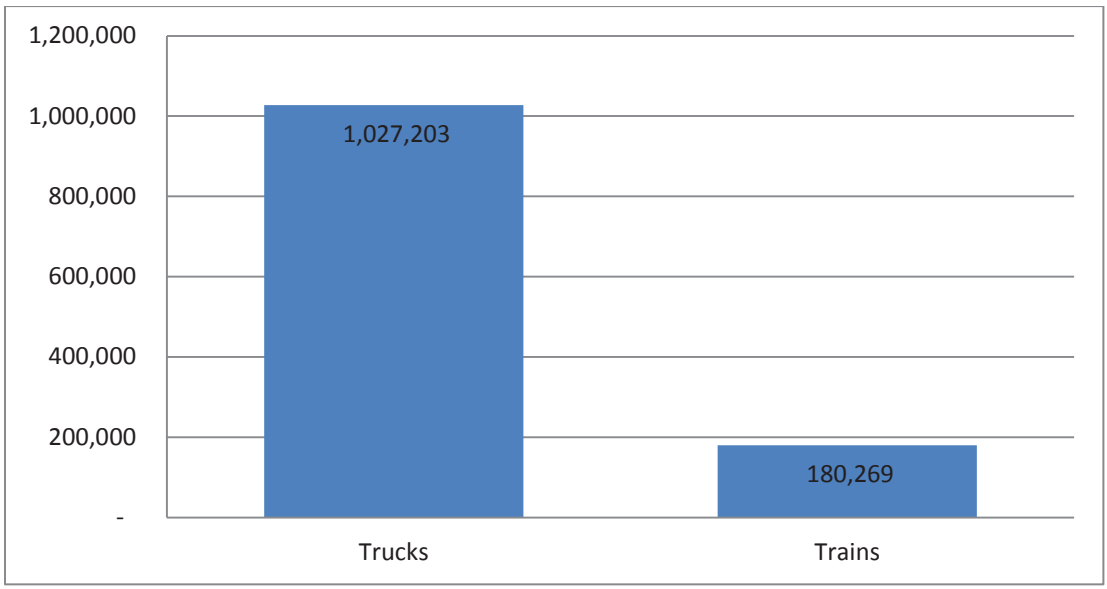


Figure 2.2-13 Comparison of Truck and Train CO_2 Emissions (pounds per day)

Other Air Quality Benefits

The analysis found the following benefits from the Build Alternative and to a lesser extent the Reduced-Segment Alternative:

- Tehachapi Pass bottleneck relief—With the project, the connection and extension of sidings would allow for reduced delays in trains waiting to pass through single-track segments, longer trains (from 6,000 feet to 8,000 feet), and facilitated sequencing of train operations.
- Emission reduction—By accommodating an increase in shipping containers throughput from 9,110 to 9,660 containers, an equal number of trucks would be removed from California highways. This reduction in 550 diesel trucks per day has a modeled net benefit to air quality through reductions in criteria pollutants and greenhouse gases.
- Improved operational capacity—With the elimination of two of the nine single-track segments in the Tehachapi Pass, the overall operational efficiency and capacity of train movements is improved, allowing for longer trains and fewer single-track scheduling delays.
- Traffic congestion relief—It is expected that there would be a reduction of 550 freight trucks from California highways because of the Build Alternative. This reduction in trucks would lead to less traffic congestion and its associated emissions. This reduction in trucks is consistent with the statewide strategy for reducing pollution from vehicular congestion.
- Road maintenance reduction—With fewer trucks on California highways, there would be less road deterioration and increased road longevity, and therefore less need for maintenance and repair of the roadway pavements.

Localized Air Quality Analysis at Chavez Center

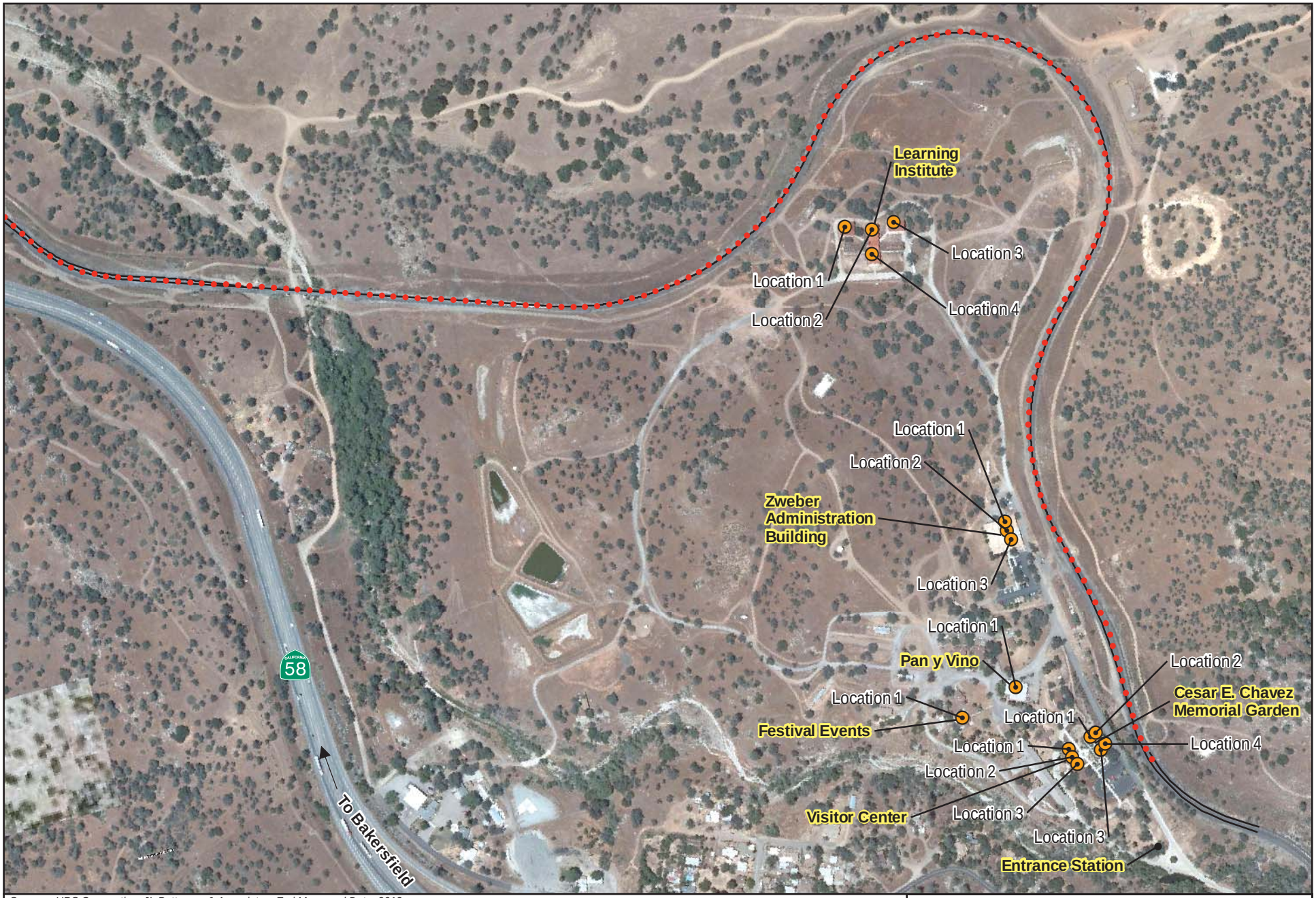
To evaluate the cumulative exposure of train exhaust on people, a localized air quality analysis was done at the National Chavez Center. The analysis quantified the concentrations of air pollutants that people at the National Chavez Center nearest to the project site would be exposed. The exposure relative to the state and federal ambient air quality standards was then evaluated. The analysis used a peak train volume of 56 trains per day that represents the capacity of the track after project completion. This worst-case train volume was selected to be analyzed to provide a conservative localized air impact analysis despite the project resulting in an average train volume of 40 trains-per-day.

Air dispersion modeling used the American Meteorological Society/EPA Regulatory Model, AERMOD. Four criteria air pollutants were modeled: carbon monoxide, PM_{10}, $PM_{2.5}$ and oxides of nitrogen (NO_x). These pollutants are typical of diesel engine exhaust. The model input included meteorological data, modeling land use classification, receptors, terrain, and pollutant averaging times.

Offsite receptor locations were used in the modeling to determine the location of the highest pollutant impact. As pollutants disperse from the points where they are emitted, the concentrations of pollutants decrease. Sixteen receptor locations within the National Chavez Center were selected to represent locations where people would congregate, in addition to a regular-spaced grid of 646 receptor points within the National Chavez Center campus (see Figure 2.2-14).

For comparison and modeling for other portions of this Air Quality section, 50 trains per day for the Build Alternative and the Reduced-Segment Alternative were used as an average. For the most conservative analysis representing an infrequent peak, 54 trains per day for the Reduced-Segment and 56 trains per day for the Build Alternative were used.

Table 2.2-10 shows the concentrations of pollutants at each of the receptor locations at the center.



Sources: URS Corporation; JL Patterson & Associates; Esri Maps and Data, 2013

0 18 Miles

Legend

National Chavez Center

- Receptor Location
- Volume Source Location

BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

AERMOD Model Source and Receptor Location

March 2013 | Figure 2.2-14

Table 2.2-10 Air Pollution Concentrations at Receptors within the National Chavez Center Projected for 2015 (Build Alternative, 56 trains per day)

	Pollutant	CO (ppm)	NO_2 (ppb)		PM_{10} ($\mu g/m^3$)		$PM_{2.5}$ ($\mu g/m^3$)	
	Averaging Time	8-hr	1-hr	Annual	24-hr	Annual	24-hr	Annual
Chavez Memorial Garden	Receptor Location 1	0.01	3	0.3	0.7	0.2	0.7	0.2
	Receptor Location 2	0.01	3	0.3	0.7	0.2	0.7	0.2
	Receptor Location 3	0.01	3	0.3	0.7	0.2	0.7	0.2
	Receptor Location 4	0.01	3	0.3	0.7	0.2	0.7	0.2
Visitor Center	Receptor Location 1	0.01	4	0.3	0.7	0.2	0.7	0.2
	Receptor Location 2	0.01	4	0.3	0.7	0.2	0.7	0.2
	Receptor Location 3	0.01	4	0.3	0.7	0.2	0.7	0.2
Pan Y Vino	Receptor Location 1	0.01	3	0.3	0.6	0.2	0.6	0.2
Zweber Administration Building	Receptor Location 1	0.01	3	0.3	0.6	0.2	0.6	0.2
	Receptor Location 2	0.01	3	0.3	0.6	0.2	0.6	0.2
	Receptor Location 3	0.01	3	0.3	0.6	0.2	0.6	0.2
Festival Events	Receptor Location 1	0.01	3	0.3	0.5	0.2	0.5	0.2
Learning Center	Receptor Location 1	0.01	4	0.4	0.6	0.3	0.6	0.3
	Receptor Location 2	0.01	4	0.4	0.7	0.3	0.7	0.3
	Receptor Location 3	0.01	4	0.4	0.7	0.3	0.7	0.3
	Receptor Location 4	0.01	5	0.4	0.7	0.3	0.7	0.3
Maximum Project Emissions for All 646 points on a grid		0.02	8	0.7	1.4	0.5	1.3	0.5
Ambient Concentration[1]		1.88	72	23	179	56	120	23
Project + Ambient Concentration		2	80	24	180	57	121	23
California Ambient Air Quality Standards (CAAQS)		9	180	30	50	20	NA	12
National Ambient Air Quality Standards (NAAQS)		9	100	53	150	NA	35	15
Percent of Project Concentrations to the Ambient Background		1%	11%	3%	1%	1%	1%	2%

Notes:
1 Based on a statewide average http://www.arb.ca.gov/adam/topfour/topfourdisplay.php
ppm= Parts per Million
ppb= Parts per Billion
$\mu g/m^3$= Micrograms per Cubic Meter

The federal and state ambient air quality standards for PM_{10} and $PM_{2.5}$ are already exceeded at the Bakersfield air monitoring stations without including project-related emissions (see Table 2.2-10). Because existing PM_{10} and $PM_{2.5}$ concentrations already exceed the ambient air quality standards, the project's emissions are evaluated against Environmental Protection Agency Significant Impact Levels (SILs) to determine whether an emissions source may contribute substantially to an existing exceedance of the ambient air quality standards. Each of the three project alternatives resulted in air pollutant concentrations that are below the state and federal ambient air quality standards (see Table 2.2-11).

Table 2.2-11 Maximum Difference in Particulate Matter Concentrations between Analysis Scenarios for the National Chavez Center

Analysis Scenarios	PM10 (µg/m³)		PM2.5 (µg/m³)	
	24-hour	Annual	24-hour	Annual
Year 2015 Project (56 Trains) minus Year 2015 No-Build Alternative (56 Trains)	0.19	0.08	0.19	0.08
EPA Significant Impact Level	5.0	1.0	1.2	0.3

Source: AERMOD
µg/m³= Micrograms per Cubic Meter

Carbon Monoxide (CO) Hot-spots

The potential for pollutant hot-spots could also occur from the increase in roadway vehicle idling due to the increase in the number of locomotives traveling and longer trains at at-grade rail crossings.

The project would accommodate a larger proportion of 8,000-foot trains through the Tehachapi Pass. The increase in train length would specifically affect the adjacent locale from Keene to east of the city of Tehachapi. The city of Tehachapi is about 5 miles southeast of the nearest segment of railroad track that would be improved. There are no planned railroad improvements within the city's jurisdiction; however, there is the potential for the project to affect the city. The city of Tehachapi is bisected by existing double tracked railroad. The city maintains a wide range of land uses, including residential, commercial, industrial, and public facilities on both sides of the tracks. North of the railroad tracks, land uses primarily consist of heavy industrial, light industrial and commercial land uses, along with a small percentage of residential properties. A hospital is also in the process of relocating to the north part of town. South of the railroad tracks, land uses are primarily residential, commercial, and open space with schools, parks and public facilities, including the fire station and police department.

Additionally, there are currently no grade separated crossings within the old town area of the city, and one grade separated crossing at Tucker road, on the west edge of the city. As a result of the longer gate down time needed to accommodate a longer train, cars would idle at intersections. A quantitative analysis of localized carbon monoxide (CO) concentrations was conducted within the city of Tehachapi to determine whether excessive localized air pollutant concentrations would occur. The analysis was conducted in accordance to the methodology established by the Transportation Project-Level Carbon Monoxide Protocol (Caltrans 1997). Carbon monoxide is selected for modeling at intersections with congested traffic due to the persistence of this pollutant after it is emitted and its human health effects.

A carbon monoxide hotspot analysis determined whether excessive concentrations of carbon monoxide would occur from roadway vehicle idling caused by the additional length of train enabled by the project. The following intersections were assessed for the potential for the creation of carbon monoxide hotspots:

- Dennison Road and Tehachapi Boulevard, city of Tehachapi
- Green Street and Tehachapi Boulevard, city of Tehachapi
- Morning Drive Edison Highway, city of Bakersfield
- Comanche Drive and Edison Highway, city of Bakersfield

A worst-case approach was used in the CO hotspot analysis that included the following inputs:

- Stagnant wind conditions
- Worst-case wind directions
- Highest peak-hour traffic volumes
- Emission rates based on an average vehicle speed of one mph for the entire peak hour
- All peak-hour roadway vehicles delayed by trains

Table 2.2-12 shows the concentrations of CO relative to the one-hour and eight-hour CAAQS. These concentrations include air pollutant concentrations from roadway vehicles, the ambient concentration, and emissions from a maximum capacity of 56 trains. The results of the intersection CO modeling demonstrate that concentrations are substantially below the State of California's one-hour and eight-hour health standards. As such, no significant health impacts are expected from additional train delays at the analyzed intersections. Modeling outputs are included in the Air Quality Study Report contained in Appendix D to this document.

The results of the intersection CO modeling demonstrate that concentrations are substantially below the State of California's one-hour and eight-hour health standards. As such, no significant health impacts are expected from additional train delays at the analyzed intersections.

Table 2.2-12 CO Concentrations at Intersections in the City of Tehachapi (parts per million)

Intersection	1-Hour CO Concentration	1-Hour CAAQS	8-Hour CO Concentration	8-Hour CAAQS	Exceeds CAAQS?	
					1-Hour	8-Hour
Dennison Road and Tehachapi Boulevard (Tehachapi)						
Northeast Receptor	5	20	3	9	No	No
Southeast Receptor	5	20	3	9	No	No
Southwest Receptor	5	20	3	9	No	No
Northwest Receptor	5	20	3	9	No	No
Green Street and Tehachapi Boulevard (Tehachapi)						
Northeast Receptor	5	20	4	9	No	No
Southeast Receptor	5	20	3	9	No	No
Southwest Receptor	5	20	3	9	No	No
Northwest Receptor	5	20	4	9	No	No
Morning Drive and Edison Highway (Bakersfield)						
Northeast Receptor	7	20	5	9	No	No
Southeast Receptor	6	20	4	9	No	No
Southwest Receptor	6	20	4	9	No	No
Northwest Receptor	7	20	5	9	No	No
Comanche Drive and Edison Highway (Bakersfield)						
Northeast Receptor	6	20	4	9	No	No
Southeast Receptor	6	20	4	9	No	No
Southwest Receptor	6	20	4	9	No	No
Northwest Receptor	6	20	4	9	No	No

Construction

Short-term construction impacts were analyzed to determine whether any regional emissions would come from the Build Alternative or Reduced-Segment Alternative. The Build Alternative and Reduced-Segment Alternative would generate regional emissions during the construction phase of the two double-track segments. Construction emissions are temporary and would stop at completion of construction of the project. The main sources of emissions during construction are from vehicle exhaust and fugitive dust generation from disturbance of the soil during grading and excavation activities. Disturbed soil areas would also be a source of particulate emissions. Caltrans evaluates construction emissions using a variety of factors including impacts to sensitive receptors; the project's general compliance with local rules, ordinances and regulations; and standard construction specifications.

The level of impact for project construction emissions is based on the intensity of construction emissions, its duration, and proximity of sensitive receptors. In terms of

intensity, construction emissions were quantified. These qualities are shown in Table 2.2-13. Construction emissions were found to be below the San Joaquin Valley Air Pollution Control District and Eastern Kern Air Pollution Control District regional thresholds. Construction is expected to take two years, broken down into two one-year segments of construction.

During construction, the Build Alternative and Reduced-Segment Alternative would generate air pollutants (see Table 2.2-13). Exhaust from construction equipment contains hydrocarbons, oxides of nitrogen, carbon monoxide, suspended particulate matter, and odors. Windblown dust would also be generated during excavation, grading, hauling, and various other activities. The impacts of these activities would vary each day as construction progresses.

Table 2.2-13 Project Construction Emissions

Construction Year	Criteria Pollutants (tons per year)						Greenhouse Gases (tons per year)
	VOC	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$	CO_2
Reduced Segment Alternative							
Year 2013-2014 Walong to Marcel Segment – EKAPCD	1.21	9.08	5.91	0.01	0.89	0.71	954.56
Build Alternative							
Year 2013-2014 Walong to Marcel Segment – EKAPCD	1.21	9.08	5.91	0.01	0.89	0.71	954.56
Year 2014-2015 Cliff Siding Segment - SJVAPCD	1.12	8.29	5.78	0.01	0.73	0.58	957.24

Source: CalEEMOD conducted by URS, 2013

Because the project is in two air basins, construction emissions were estimated according to the worst-case conditions within the air basins. The Urban Emissions Model created by the state Air Resources Board was used. Length of the track within the San Joaquin Valley Air Basin and Mojave Desert Air Basin is 1.01 miles and 0.37 miles, respectively.

The project area is sparsely populated, but a few sensitive receptors could be affected by construction activities. The National Chavez Center, considered a sensitive receptor, is next to the Rowen-to-Woodford segment. But, as discussed previously, the project's construction emissions are not considered to be substantial and would be minimized with adherence to existing fugitive dust control regulations.

Construction of the project would not result in a substantial level of emissions, would not expose sensitive receptors to substantial levels of air pollution, and would reduce both dust generation and construction vehicle exhaust consistent with Caltrans' standard specifications and air district regulations.

Air Quality Plan Consistency

The California Environmental Quality Agency Guidelines state that the air pollutant emissions of both the Build Alternative and Reduced-Segment Alternative should be assessed to determine whether there would be a conflict with or obstruct implementation of applicable air quality plans. The Build Alternative and Reduced-Segment Alternative would not result in a conflict or obstruction of air quality plans because they would result in a number of benefits to air quality. The benefits include improved efficiency within the Tehachapi rail corridor (less idling), greater rail capacity that leads to lower emissions than those otherwise emitted from trucks, and reduced roadway congestion and roadway maintenance due to a reduced reliance on trucks for freight transport. Plus, the project was specifically listed as an early action project within the California Environmental Protection Agency's *Goods Movement Action Plan*. The plan's goal is to reduce vehicular congestion and air pollution. The Build Alternative and Reduced-Segment Alternative are considered to be consistent with the air quality plans.

Avoidance, Minimization, and/or Mitigation Measures

Minimization Measures

Most of the construction impacts to air quality are short-term in duration and, therefore, will not result in long-term adverse conditions. Implementation of the following measures, some of which may also be required for other purposes such as storm water pollution control will reduce any air quality impacts resulting from construction activities: BNSF would employ the following measures:

Fugitive Dust

Construction activities and operations of the tracks would comply with all applicable San Joaquin Valley Air Pollution Control District rules and regulations as follows:

- Disturbed Areas: The construction contractor would effectively stabilize for fugitive dust control all disturbed areas that are not being actively used for construction purposes, using water or nontoxic chemical stabilizers/suppressants.
- Storage Piles: The construction contractor would apply water or nontoxic chemical stabilizers/suppressants for fugitive dust control, or cover storage piles with a tarp or other suitable cover or vegetative ground cover. Following the addition of materials to,

or removal of materials from, the surface of outdoor storage piles, the piles would be effectively stabilized for fugitive dust emissions, using sufficient water or nontoxic chemical stabilizer/suppressant.

- Unpaved Roads: The construction contractor would effectively stabilize for fugitive dust control all onsite unpaved roads and offsite unpaved access roads using water or nontoxic chemical stabilizers/suppressants.
- General Watering: The construction contractor would control fugitive dust emissions during land clearing, grubbing, scraping, excavation, land leveling, grading, cut-and-fill, and demolition activities by watering the construction site a minimum of two times daily when soil conditions are dry.
- Dirt Hauls: When materials are transported offsite, the construction contractor would ensure that all material is covered or effectively wetted to limit visible dust emissions, and at least 24 inches of freeboard space from the top of containers must be maintained.
- Dirt Carryout/Trackout: The construction contractor would install and maintain an approved carryout and trackout prevention procedure (e.g., grizzlies, gravel pads, paved interior roads) at the construction ingress/egress. The construction contractor would remove mud or dirt that has accumulated on adjacent public streets at the end of each workday. In addition, carryout/trackout must be immediately removed when it extends 50 feet or more beyond the site exit. Carryout/trackout must be removed by manually sweeping, using a rotary brush broom accompanied or preceded by sufficient wetting, operating a PM10-efficient street sweeper with a minimum pick-up efficiency of 80 percent, or flushing with water if curbs or gutters are not present, and where the use of water will not be a source of trackout material or result in adverse impacts on stormwater drainage systems.
- Unpaved Road Speeds: The construction contractor would limit traffic speeds on unpaved roads to 15 miles per hour.
- Erosion Control: The construction contractor would install gravel bags or other erosion-control measures to prevent silt runoff to public roadways from sites with a slope greater than 1 percent during ground-disturbing activities.
- High Winds: The construction contractor would suspend excavation and grading activity when winds exceed 20 miles per hour.
- Revegetation: The construction contractor would revegetate disturbed soil areas with native plants to minimize wind-blown dust.

Construction Vehicle Exhaust

- Because the Build Alternative does not fit within any of the applicability criteria under Section 2.0 – Applicability of Rule 9510 (Indirect Source Review), the Build Alternative is not subject to Rule 9510.
- The construction contractor would properly service and maintain all construction equipment in accordance with the manufacturer's recommendations. BNSF has informed Caltrans and the San Joaquin Valley Air Pollution Control District that the railway intends to ensure that the project's construction vehicle fleet is consistent with the requirements of Rule 9510. BNSF does so without waiving any rights, including rights of preemption (federal rules exempting railroads from state and local regulations).

Operational

These regional emissions result from locomotive exhaust during freight transport. Emissions from locomotives are currently minimized by the following agreements:

- Statewide Rail Yard Agreement to Reduce PM at California Rail Yards (2005)
- South Coast Memorandum of Mutual Understanding (1998)
- Requirements for Intrastate Locomotive Fuel Use
- U.S. Environmental Protection Agency emission standards

2.2.7 Noise and Vibration

Regulatory Setting

State

California Environmental Quality Act

The California Environmental Quality Act requires a strictly baseline versus build analysis to assess whether a proposed project will have a noise impact. If a project is determined to have a significant noise impact under the California Environmental Quality Act, then the California Environmental Quality Act dictates that mitigation measures must be incorporated into the project unless such measures are not feasible.

Affected Environment

The following information is derived from the Noise and Vibration Technical Report completed for the project in March 2013 that is included with the Combined Technical Reports document of this Environmental Impact Report (Appendix D).

The properties within the vicinity of the existing railroad right-of-way consist mostly of private lands that are within the jurisdiction of Kern County. Properties next to the two project segments are used mainly for livestock and grazing, with some single-family residences and resource conservation land uses scattered throughout. However, other areas that could be affected by increased rail traffic include limited commercial and residential uses such as the National Chavez Center and portions of the city of Tehachapi near the railroad right-of-way but outside of the project area. The Walong to Marcel segment is at least six miles northwest of the Tehachapi Airport. The Cliff Siding Extension is over 10 miles northwest of the Tehachapi Airport.

A variety of noise and vibration measurements were taken near the railroad to establish baseline conditions. Locations were selected based upon their ability to provide a complete view of short-term noise, long-term noise, and vibration conditions. These locations, surveyed between 2009 and 2013, are identified in Table 2.2-14 through Table 2.2-17 and Figure 2.2-15 through Figure 2.2-19. In addition, a separate assessment done at 17 sensitive receptor sites for the city of Tehachapi (Table 2.2-17), was completed through computer-based modeling for noise. Details are identified in Figure 2.2-20. Future impacts, such as construction and operational noise impacts, as well as future vibration levels were also predicted and assessed using applicable vibration impact criteria under the California Environmental Quality Act as well as local standards and applicable criteria adopted by the County of Kern.

Table 2.2-14 Short-Term Noise Measurement Locations

Site Identification Number	Location
ST-1A & B	12500 Caliente Bodfish Road
ST-2A & B	28017 J Street
ST-3A & B	31370 Bealville Road
ST-4	31430 Bealville Road
ST-5	East Bena Switch
ST-7A, B, C, D & E	National Chavez Center Administration Building
ST-7F & G	National Chavez Center Private Grade Crossing
ST-8A, B, C & D	30378 Woodford-Tehachapi Road
ST-9A & B	26798 Woodford-Tehachapi Road
ST-10A, B, C & D	21812 Broome Road Loop Ranch

Source: URS, 2013

Table 2.2-15 Long-Term Noise Measurement Locations

Site Identification Number	Location
LT-1	28061 J Street
LT-2	27600 Caliente Creek Road
LT-3 &3A	National Chavez Center - Museum Garden
LT-4, 4A, B & C	National Chavez Center - Conference Center
LT-5	27300 Woodford-Tehachapi Road
LT-6	21812 Broome Road Loop Ranch

Source: URS, 2013

Table 2.2-16 Vibration Measurement Locations

Site Identification Number	Location
Location A	Near the southern fence line of adjoining residential properties, including 28017 J Street, about 135 feet north of the existing tracks.
Location B	Along the southern fence line of the property at the eastern corner of the intersection of Bealville Road and the rail line, about 97 feet north of the existing tracks.
Location C	Between the parking area and the National Chavez Center campus service road, so that the measurement position is about on the same plane as the Administration Building eastern façade. Approximate distance to the existing tracks is 141 feet.
Location D	Near a corral fence line, the measurement position is about on the same plane as the western façade of one of the occupied residential structures on the property. Approximate distance to the existing tracks to the west is 279 feet and about 381 feet to the existing tracks to the east.

Source: URS, 2013

Table 2.2-17 Estimated Existing Ambient Noise Levels within the City of Tehachapi

Site	Railroad		State Route 58		Local Street		Aircraft Noise Level (dB Ldn)	Total Estimated Ambient Noise Level (dB Ldn)
	Distance to (feet)	Noise Level (dB Ldn)	Distance to (feet)	Noise Level (dB Ldn)	Distance to (feet)	Noise Level (dB Ldn)		
1	1,364	54.1	1,050	58.7	86	56.1	-	**61.5**
2	913	55.2	1,582	56.0	-	-	-	**58.7**
3	205	69.4	2,293	53.6	68	56.0	-	**69.7**
3A	247	68.2	-	-	68	56.0	-	**68.5**
4	1,139	48.2	1,616	55.9	-	-	55.0	**58.9**
5	1,255	47.6	1,623	55.9	-	-	65.0	**65.6**
6	382	65.4	2,523	53.0	523	45.9	50.0	**65.8**
7	560	62.9	2,439	53.2	651	44.5	55.0	**64.0**
8	550	63.0	2,510	53.0	642	44.6	60.0	**65.1**
9	230	68.7	2,780	52.4	319	49.2	50.0	**68.9**
10	202	69.5	2,847	52.2	296	49.6	52.0	**69.7**
11	1,354	57.1	1,413	56.8	90	57.8	-	**62.0**
12	1,483	56.5	1,057	58.7	-	-	-	**60.7**
13	670	61.7	2,017	54.5	100	54.9	-	**63.2**
14	798	60.6	1,674	55.7	833	42.5	-	**61.9**
15	393	65.2	3,329	51.2	267	59.0	-	**66.3**
16	202	69.5	3,250	51.4	112	56.0	-	**69.8**

Source: URS, 2013

Sources: JL Patterson & Associates; URS Corporation, 2013; Esri Maps and Data, 2013;

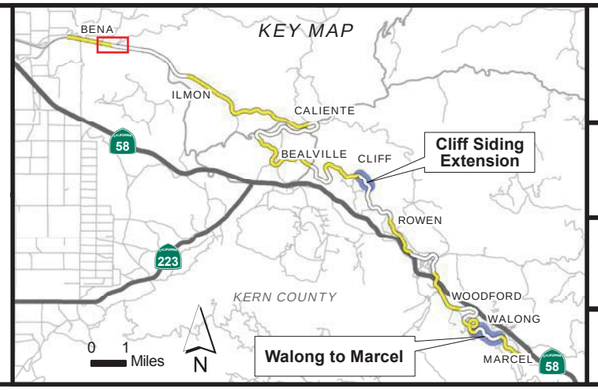
5Legend

- Single Track
- Double Track
- Tunnel

Measurement Locations

- Milepost
- Bridge
- Culvert
- Short-term Measurement Location
- Long-term Measurement Location
- Vibration Measurement Location

0 500 1,000
Feet



BNSF/UPRR Mojave Subdivision
Tehachapi Rail Improvement Project

Noise and Vibration
Measurement Locations - Bena

March 2013 | Figure 2.2-15

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Sources: JL Patterson & Associates; URS Corporation, 2013; Esri Maps and Data, 2013;

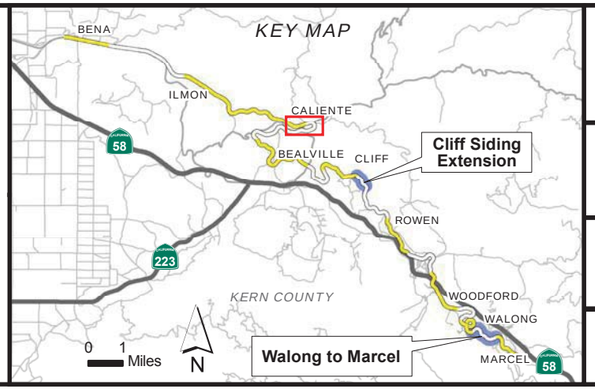
Legend

- Single Track
- Double Track
- Tunnel

Measurement Locations

- Milepost
- Bridge
- Culvert
- Short-term Measurement Location
- Long-term Measurement Location
- Vibration Measurement Location

0 300 600
Feet



BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Noise and Vibration Measurement Locations - Caliente

March 2013

Figure 2.2-16

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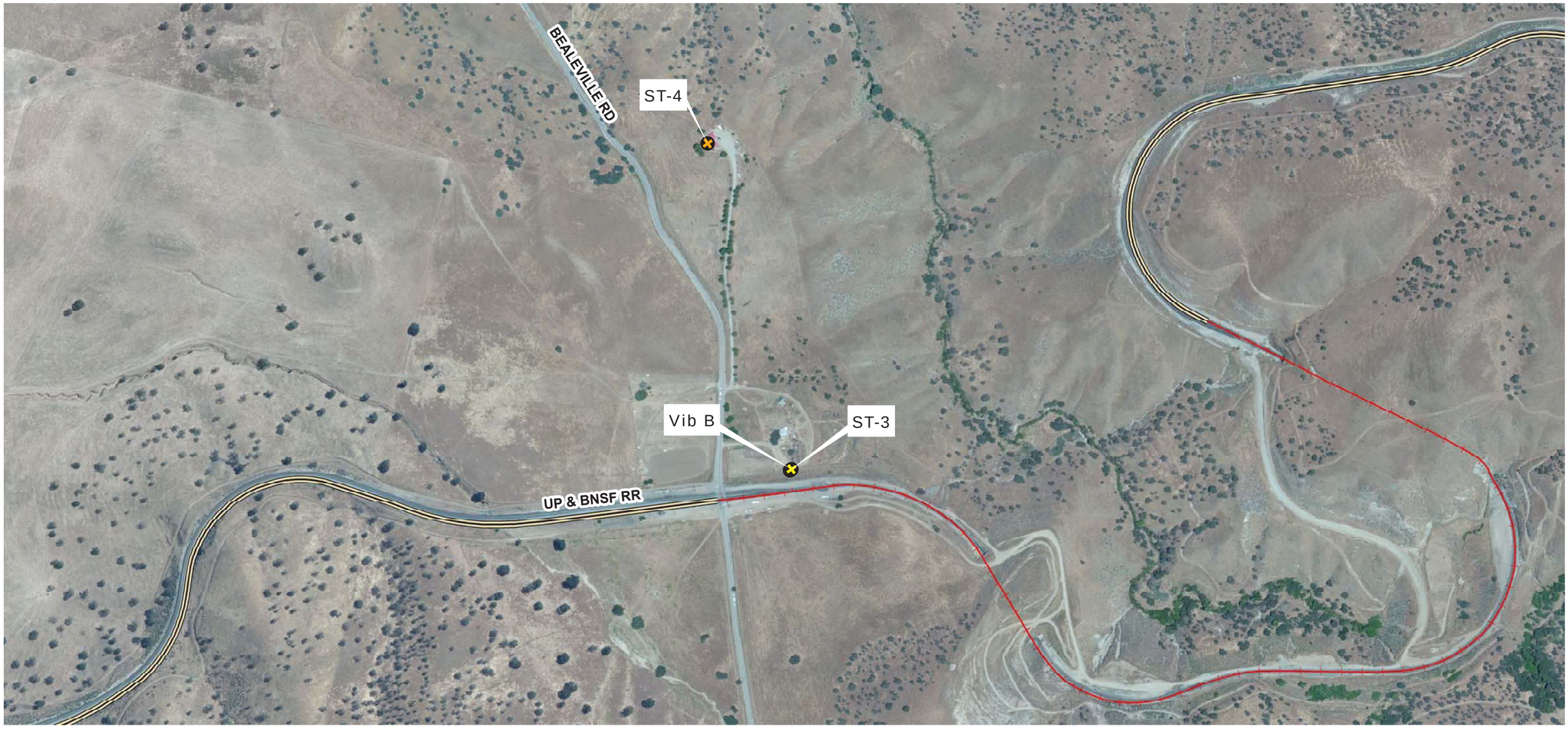


Sources: JL Patterson & Associates; URS Corporation, 2013; Esri Maps and Data, 2013;

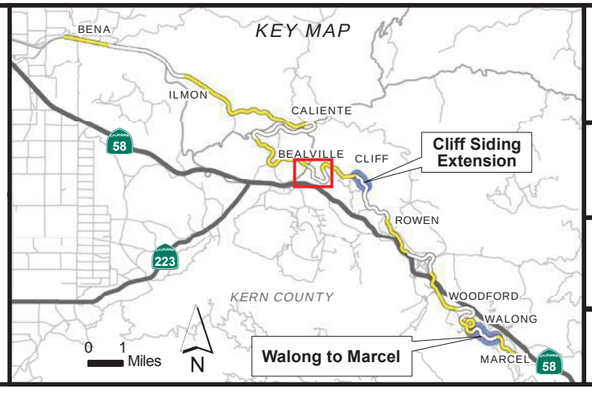
Legend

- Single Track
- Double Track
- Tunnel

Measurement Locations

- Milepost
- Bridge
- Culvert
- Short-term Measurement Location
- Long-term Measurement Location
- Vibration Measurement Location

0 500 1,000
Feet



BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Noise and Vibration Measurement Locations - Bealville

March 2013

Figure 2.2-17

Caltrans

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Sources: JL Patterson & Associates; URS Corporation, 2013; Esri Maps and Data, 2013;

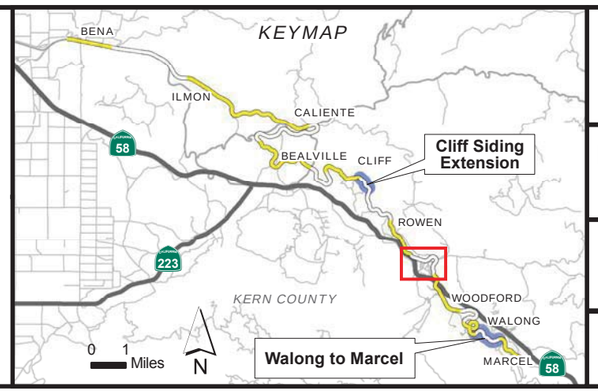
Lege

- Single Track
- Double Track
- Tunnel

Measurement Locations

- Milepost
- Bridge
- Culvert
- Short-term Measurement Location
- Long-term Measurement Location
- Vibration Measurement Location

0 500 1,000
Feet



BNSF/UPRR Mojave Subdivision
Tehachapi Rail Improvement Project

Noise and Vibration Measurement Locations - National Chavez Center

March 2013 | Figure 2.2-18

Caltrans

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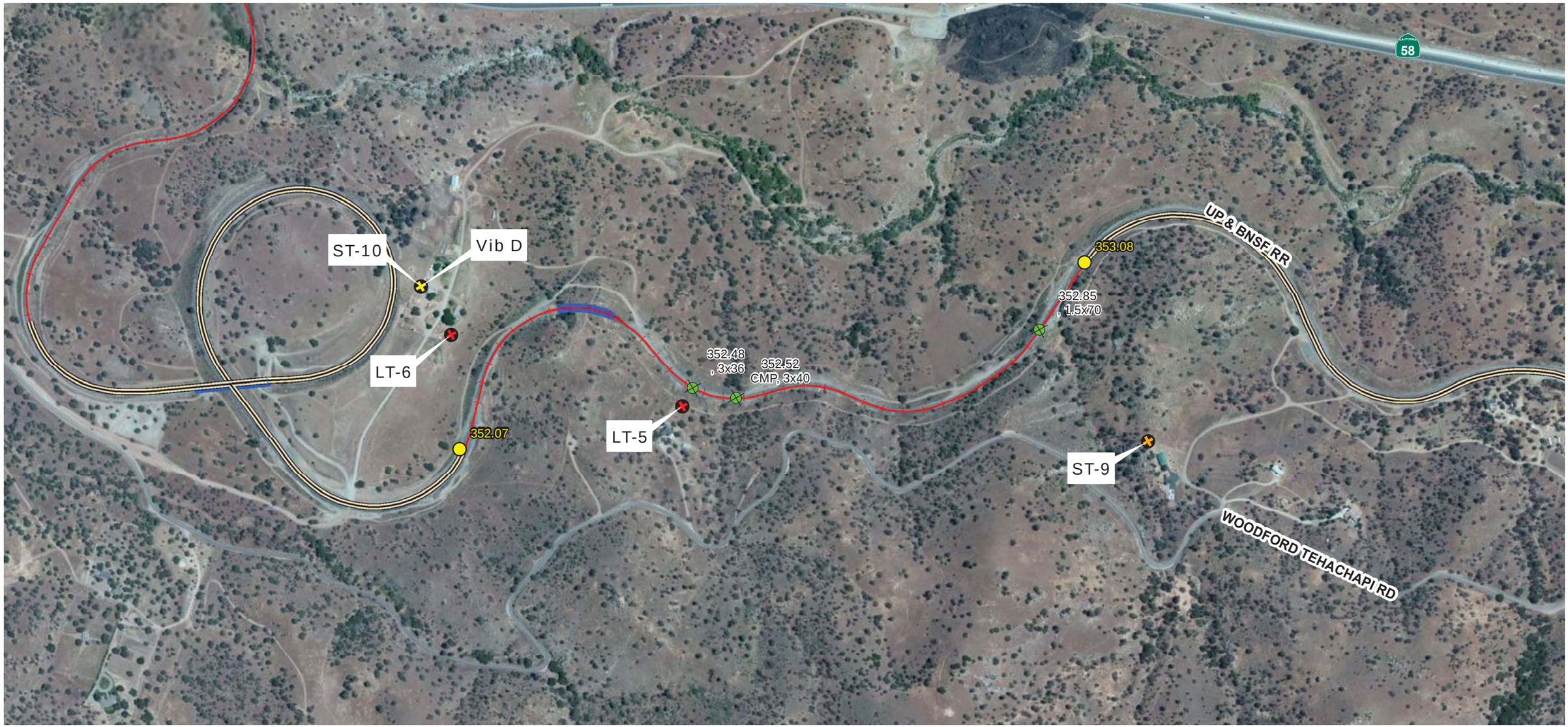


Sources: JL Patterson & Associates; URS Corporation, 2013; Esri Maps and Data, 2013

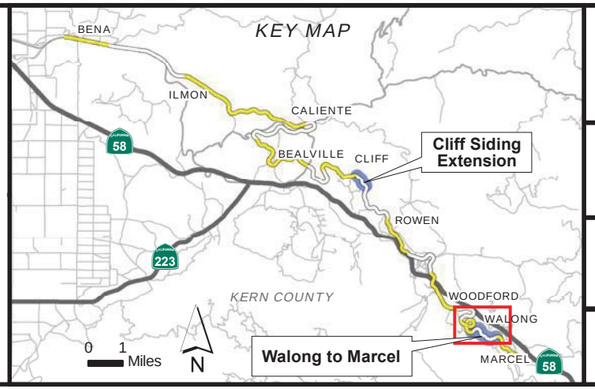
Legend

- Single Track
- Double Track
- Tunnel

Measurement Locations

- Milepost
- Bridge
- Culvert
- Short-term Measurement Location
- Long-term Measurement Location
- Vibration Measurement Location

0 600 1,200
Feet



BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Project

Noise and Vibration
Measurement Locations - Walong to Marcel

March 2013

Figure 2.2-19

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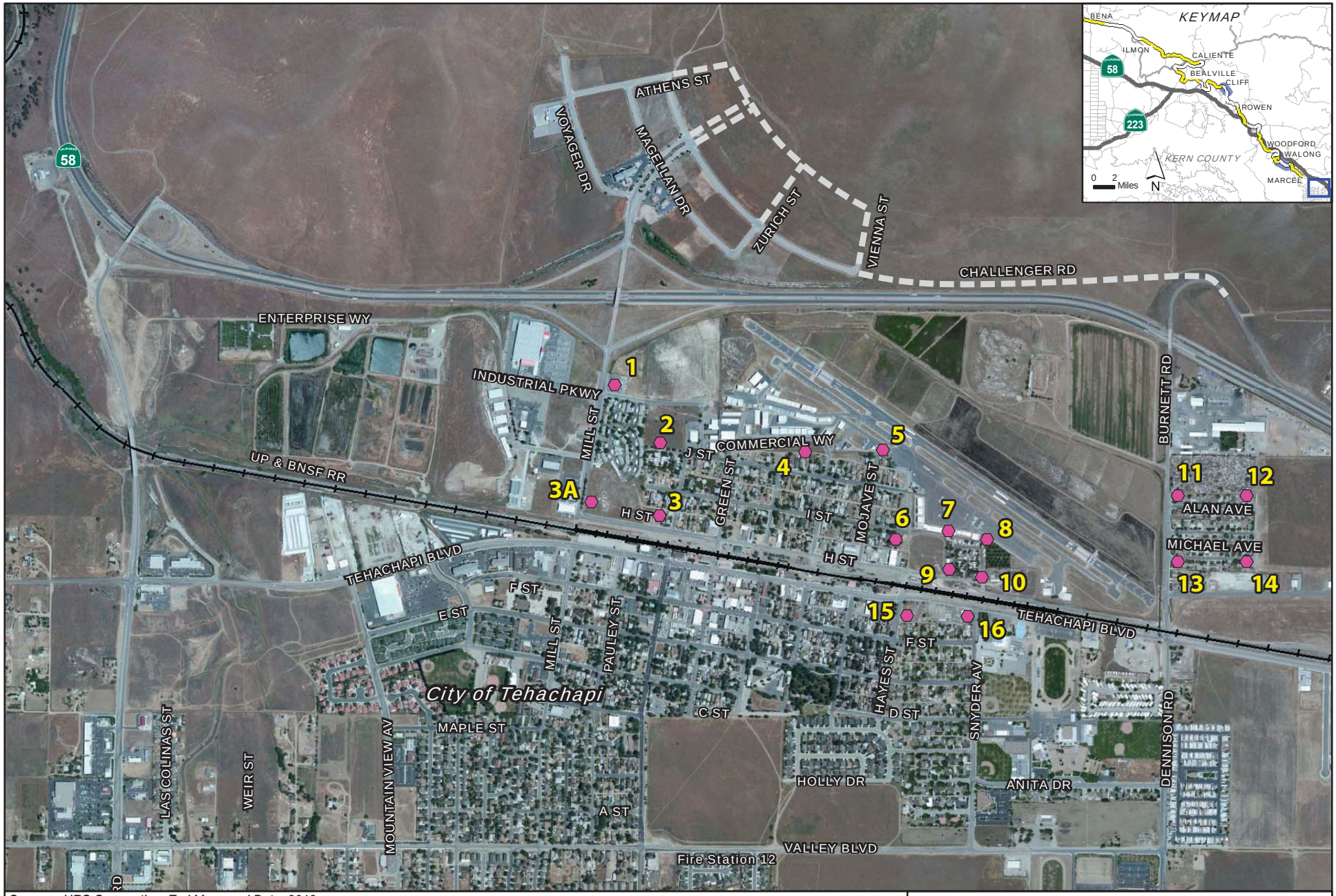

Sources: URS Corporation; Esri Maps and Data, 2013

0 550 1,100 2,200
Feet

Legend

- Noise Modeling Sites
- 3A Noise Modeling Site Number
- Tehachapi Corridor
- Future Street

BNSF/UPRR Mojave Subdivision
Tehachapi Rail Improvement Project

Noise Modeling Sites in the City of Tehachapi

March 2013

Figure 2.2-20

Environmental Consequences

Using measurement, modeling, and assessment methodologies developed for freight rail operators by Kern County and Federal Transit Administration, the noise and vibration effects of the project were predicted and compared to existing and No-Build Alternative scenarios. The predicted increase in noise and vibration levels from the project were then assessed with respect to the applicable guidance set forth by the California Environmental Quality Act Guidelines.

The Federal Transit Administration uses a sliding scale to determine the threshold of significance for noise impacts. This scale uses three different factors to determine potential impacts: the type of land use category that would be affected by noise[7], the existing noise within the area, and the predicted increase in noise. Based on these factors, noise level increases are judged as having no impact, a moderate impact, or a severe impact. In addition, the Federal Transit Administration scale also works to limit increases of cumulative sound exposure in areas that currently have high levels of ambient noise exposure already present in an unacceptable living environment. Figures from the Federal Transit Administration are located below.

[7] Federal Transit Administration Land Use Categories are further detailed in the Noise Technical Report, included in this document in Appendix D.

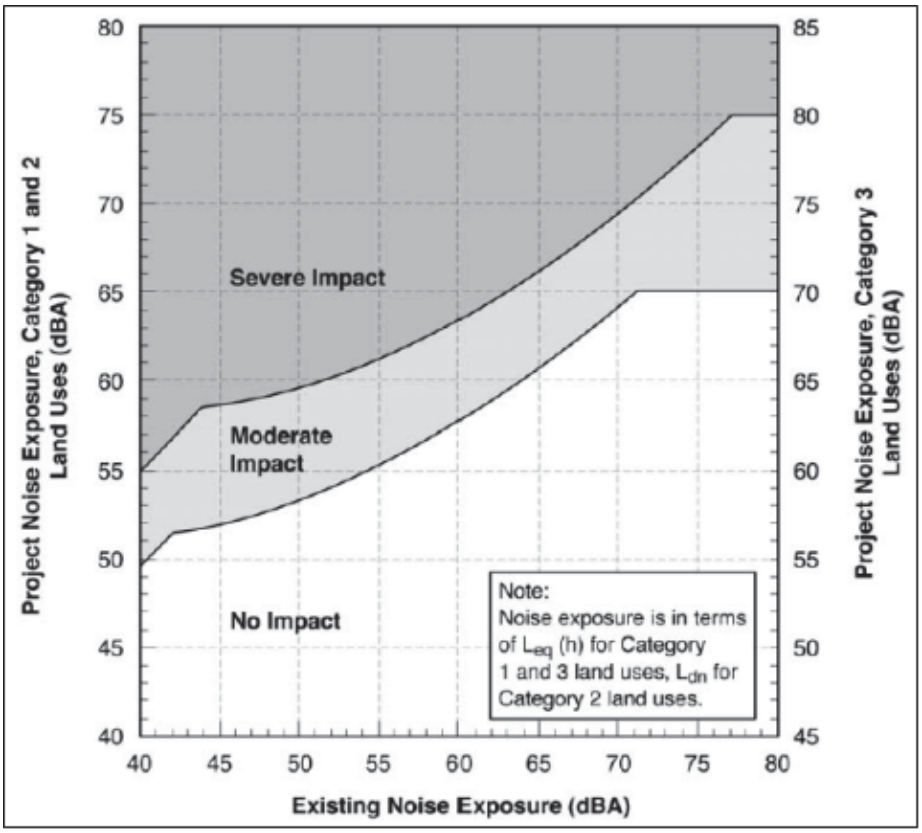

Figure 2.2-21 Federal Transit Administration Noise Impact Criteria

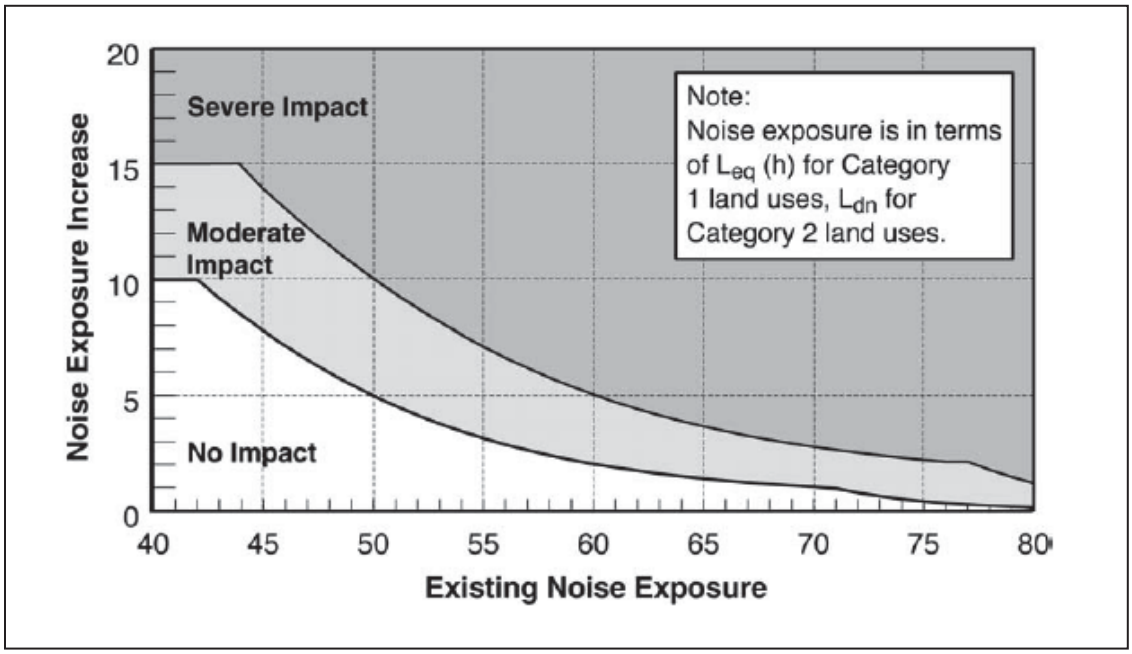

Figure 2.2-22 FTA Increase in Cumulative Noise Criteria

The Federal Transit Administration has also developed applicable criteria to assess potential vibration impacts associated with rail projects. The criteria also establish vibration limits relative to different types of vibration-sensitive receptors to determine when impacts are significant.

Build Alternative

Construction Impacts

Construction activities for the project would require the use of vehicles and heavy equipment, ranging from concrete mixers to jackhammers, that could produce potentially significant noise and vibration. Noise generated during construction could adversely affect nearby residents. However, project construction would take place in two phases, one for each project segment. It is estimated that the duration of construction for the entire project would be about two years; each segment would require about 12 months of construction activity.

The Federal Transit Administration provides typical construction noise levels for various pieces of construction equipment at a distance of 50 feet. However, sound levels would be attenuated through a variety of mechanisms, which would result in a 6 decibel decrease in the sound level with every doubling of distance from the source (Diehl, 1973). The Noise and Vibration Technical Report identifies that the closest noise-sensitive receptors to the project (as represented by ambient noise measurements LT-1 and LT-5) are about 125 feet from the track centerline. A noise level of 89 decibels (dBA L_{eq}) at 50 feet from conventional construction activity would attenuate to about 81 dBA L_{eq} at 125 feet from the source. This noise level is higher than the typical daytime noise level measured at LT-1 of 74.1 dBA L_{eq} and at LT-5 of 73.6 dBA L_{eq}, and results in a 7 dBA increase of ambient noise from current daytime noise level measured at the LT-1 and LT-5 locations.

Most construction activities are expected to be short term and would take place during the least noise-sensitive time of the day. Kern County's Noise Control Ordinance allows construction activities to take place between 6:00 a.m. and 9:00 p.m. Monday through Friday and 8:00 a.m. to 9:00 p.m. on weekends; activities scheduled for other times would be required to obtain a permit and would be subject to specific requirements from the county. The Federal Transit Administration also provides Prescriptive Construction Noise Impact Guidelines that establish a 90 dB L_{eq} construction noise exposure threshold for residential and other similarly sensitive uses. All of the analyzed locations would be exposed to construction noise levels below the Federal Transit Administration's daytime construction threshold.

Noise within the construction site could exceed levels considered safe for construction workers. Control measures are recommended to reduce the noise levels to the extent practicable to conform to the Federal Occupational Safety and Health Act (OSHA) and California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) regulations for worker noise exposure (8 CCR, General Industrial Safety Orders, Article 105, Control of Noise Exposure, §5095, et seq.).

Similar to noise impacts, the Federal Transit Administration provides information to assess vibration impacts from construction activities and has determined that at least 0.12 inches per second for peak particle velocity is required to result in potential damage to "extremely fragile historic buildings." The Noise and Vibration Technical Report identifies that that the worst case vibration associated with the project that would occur to sensitive properties is predicted to be less than 0.03 inches per second at peak particle velocity. Vibration from construction activities at the nearest sensitive property is expected to be mostly imperceptible while construction is underway, and no substantial vibration impacts would result during project construction.

Operational Impacts

Noise assessments were done at representative noise sensitive locations near the project segments, as well as within the city of Tehachapi. Rail noise was determined to be the dominant noise source at each measurement location. The Federal Transit Administration Noise Impact Assessment Spreadsheet model (2007) was then used to calculate noise levels from train operations on the rail line for both existing and Build Alternative scenarios. These estimates also included parameters such as project type and location of alternatives, representative noise source levels, design speed, time, and frequency of operation.

The modeling accounted for the distribution of train activity along the tracks in each scenario. In the existing scenario, 50 percent of the total BNSF and UPRR trains per day were assumed to run to the east (uphill) and 50 percent were assumed to run to the west (downhill). In addition, computer-based modeling was also used to enhance analysis along sensitive receptor sites such as the National Chavez Center. Detailed results of this analysis are presented in Table 4.1 of the Noise Technical Report.

While the project would increase the frequency of 8,000 foot trains through the Tehachapi Trade Corridor, it is important to note that the project would not substantially affect the number of trains. There is currently an average of 35 trains per day traveling through the Tehachapi Trade Corridor. Once the project has been completed, there will be an average of 40 trains per day. The analysis found that noise from daily railroad operations associated

with the proposed project, combined with existing high railroad noise levels, would result in a maximum increase of 0.7 decibels in the project area, including the National Chavez Center. The increases in operational noise would either be moderate or no impact according to Federal Transit Administration methodology for all sites. In addition, an assessment of the 17 receptor sites in the city of Tehachapi identified a range of operation-related noise increases from 0.1 to 1.0 decibels.

Using Federal Transit Administration methodology, the expected noise increases associated with operation of the project would result in no impacts to all sites except for two: LT-1 at 28061 J Street and LT-5 at 27300 Woodford-Tehachapi Road. Both sites are rural residential properties. The increase at both sites is 0.1 decibel, and therefore, according to the Federal Transit Administration's sliding scale assessment for cumulative noise impacts, would be considered moderate. However, a 0.1-decibel increase is physically indiscernible to human hearing, even under laboratory conditions, and would result in no physical impacts to representative noise-sensitive receptors (noise level increases less than 3 decibels are generally considered undetectable by humans). Although soundwalls or berms could effectively decrease the overall noise exposure at the affected sites, the actual projected increase in noise of 0.1decibel is too small to be considered substantial; furthermore, the rural nature of the project site would make the use of noise barriers infeasible and unreasonable.

For site LT-1, this row of homes has front yards facing the rails. Noise barriers placed along the front yards of these homes would require access points through the soundwalls for vehicular traffic and foot traffic. This would result in large gaps in the soundwall, which would make the noise barrier ineffective and unfeasible. For site LT-5, the property also supports an internet webcam system in the rear for the express purpose of providing video coverage of passing trains. A soundwall would block the view the cameras need to record passing trains.

Reduced-Segment Alternative

Construction Impacts

Similar to the Build Alternative, construction activities for the Reduced-Segment Alternative would require the use of vehicles and heavy equipment, ranging from concrete mixers to jackhammers, that could produce potentially significant noise and vibration. Noise generated during construction could adversely affect nearby residents. It is estimated that the duration of construction for the Reduced-Segment Alternative would be about 12 months. As stated in the Build Alternative analysis, most of the construction activities are expected to be short-term and would take place during the least noise-sensitive time of the day. The Kern County Noise Control Ordinance would still be applicable for construction activities. The Federal

Transit Administration also provides Prescriptive Construction Noise Impact Guidelines that establish a 90 dB Leq construction noise exposure threshold for residential and other similarly sensitive uses. All of the analyzed locations would be exposed to construction noise levels below the Federal Transit Administration's daytime construction threshold.

However, noise within the construction site could exceed levels considered safe for construction workers. Control measures, as identified in the Build Alternative analysis, would still be recommended to reduce the noise levels to the extent practicable in order to conform to Federal Occupational Safety and Health Act (OSHA) and California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) regulations (8 CCR, General Industrial Safety Orders, Article 105, Control of Noise Exposure, §5095, et seq.) for worker noise exposure.

Similar to Build Alternative, the Noise and Vibration Technical Report identifies that the worst case vibration associated with the project would occur to sensitive properties is predicted to be less than 0.03 inches per second at peak particle velocity. Vibration from construction activities at the nearest sensitive property is expected to be mostly unnoticeable while construction is underway, and no substantial vibration impacts would result during project construction.

Operational Impacts

The maximum noise level increase from the Reduced-Segment Alternative is 0.1 dBA L_{dn}. The same number of trains would occur (50 trains per day), but the proportion of the 8,000-foot trains would be less. Noise level increases associated with the Reduced-Segment Alternative are well under the 3-decible human-hearing threshold and would not result in a significant noise impact.

The increases in noise associated with operation of the Reduced-Segment Alternative were also calculated for the 17 residential receivers within the city of Tehachapi. Results are shown in Table 4-12 of the Noise Technical Report. A maximum noise increase of 0.1 decibel is anticipated to occur under the Reduced-Segment Alternative. This increase in noise level is below the Federal Transit Administration threshold for any impact.

No-Build Alternative

Under the No-Build Alternative, the project improvements would not be built and railroad operations in the region would continue without change. BNSF and UPRR traffic would continue to operate along the same lines. Future freight demand would continue to increase until the rail system reached capacity; however, because the railroad line currently operates near capacity, the No-Build Alternative is acoustically nearly the same as the existing

scenario. In addition, the eastbound and westbound distribution of BNSF and UPRR trains would remain unchanged. There is currently an average of 35 trains per day traveling through the Tehachapi Trade Corridor. Once the project is completed, there will be 40 trains per day. The increase in train volume is independent of the project and would occur regardless of project construction. According to the Noise and Vibration Technical Report, there would be a maximum noise increase of 0.5 decibel under the No-Build Alternative conditions, a level below the Federal Transit Administration's threshold for any impact.

Avoidance, Minimization, and/or Noise Abatement

Minimization Measures

- To minimize construction noise and maintain conformance to applicable worker safety requirements, BNSF would use the following measures in the project contract specifications before beginning construction activities:
- All noise-producing project equipment and vehicles using internal combustion engines must be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition that meet or exceed original factory specification. Mobile or fixed "package" equipment (e.g., arc-welders, air compressors) must be equipped with shrouds and noise control features that are readily available for that type of equipment.
- All mobile or fixed noise-producing equipment used on the project, which is regulated for noise output by a local, state, or federal agency, must comply with such regulations during project activities.
- Electrically-powered equipment instead of pneumatic or internal combustion powered equipment must be used, where feasible.
- Material stockpiles and mobile equipment staging, parking, and maintenance areas must be as far as practicable from noise-sensitive receptors.
- Construction site and access-road speed limits must be established and enforced during the construction period.
- Construction operations must be limited to 6:00 a.m. to 9:00 p.m. Monday through Friday, and 8:00 a.m. to 9:00 p.m. on weekends. Construction contract provisions must limit hours of construction, including noisy maintenance activities and all spoils and material transport, to these periods and days.
- The use of noise-producing signals such as horns, whistles, alarms, and bells must be for safety warning purposes only.

- The on-site construction supervisor must have the responsibility and authority to receive and resolve noise complaints. A clear appeal process to the owner must be established prior to construction commencement that would allow for the resolution of noise problems that cannot be immediately solved by the site supervisor.
- All project workers exposed to noise levels above 80 decibels must be provided with personal hearing-protection equipment such as earplugs and/or earmuffs); areas where noise levels are routinely expected to exceed 85 decibels must be clearly posted with signs stating "Hearing Protection Required in this Area."

2.3 Biological Environment

2.3.1 Natural Communities

Regulatory Setting

This section of the document discusses natural communities of concern. The focus of this section is on biological communities, not individual plant or animal species, discussed in other subsections below. The emphasis of the section should be on the ecological function of the natural communities within the area. This section also includes information on wildlife corridors and habitat fragmentation. Wildlife corridors are areas of habitat used by wildlife for seasonal or daily migration. Habitat fragmentation involves the potential for dividing sensitive habitat and thereby lessening its biological value.

Habitat areas that have been designated as critical habitat under the Federal Endangered Species Act are discussed below in the Threatened and Endangered Species Section 2.3.5. Wetlands and other waters are also discussed below in Section 2.3.2.

Affected Environment

A Natural Environment Study-Minimal Impacts report was prepared to evaluate the on-site biological resources and determine the potential for occurrence of common and special-status species, their habitats, and other special aquatic resource areas within the biological study area of the project as shown in Figure 2.3-1. This report, prepared in November 2009 and updated in April 2012, January 2013 and May 2013, is attached to the Combined Technical Reports document of this Environmental Impact Report (Appendix D). The biological study area includes four vegetation communities, which are described below. There are also four disturbed vegetation communities, as well as disturbed/developed land-cover types.

BENA
ILMON
CALIENTE
Cliff Siding Extension
BEALVILLE
ROWEN
WOODFORD
WALONG
Walong to Marcel
MARCEL
58
223

Sources: USGS National Hydrography Dataset

Legend

- Existing Rail Corridor
- Migration Linkages*
- Proposed Double Track Extension

Sensitive Species**

- Plant Species Possible Range
- Wildlife Species Possible Range

* Obtained from the November 2000 conference hosted by the California Wilderness Coalition, et al.
** California Natural Diversity Database 2013

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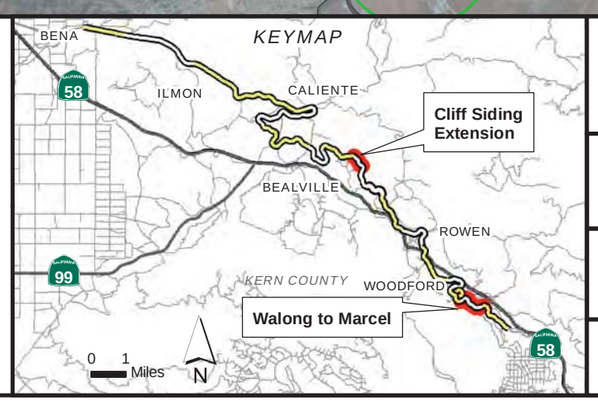
Miles



BNSF/UPFF Mojave Subdivision Tehachapi Rail Improvement Project

Tehachapi Pass
Potential Areas of Biological Resources

March 2013

Figure 2.3-1

Caltrans

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Blue Oak Woodland

Blue oak woodland is dominated by blue oak (*Quercus douglasii*) but usually includes several other oaks as well as gray pine (*Pinus sabiniana*). Stands vary from open savannas with grassy understories to fairly dense woodlands with shrubby understories. Blue oak woodland often occurs on well-drained soils usually below 3,000 feet to 4,000 feet. Blue oak woodlands are found along the Cliff Siding Extension of the biological study area.

Foothill Pine-Oak Woodland

Foothill pine-oak woodland contains a mix of gray pine and blue oak. Pure stands of either tree do occur, but mixed stands are more common. Gray pine usually towers over the oaks. Understories usually are dominated by introduced annuals. This woodland favors well-drained sites and is usually found on rocky or exposed sites along ridges or canyons with poor or shallow soils. Foothill pine-oak woodland are found along the Walong-to-Marcel segment of the biological study area.

Mojave Mixed Woody Scrub

Mojave mixed woody scrub is a desert scrub community that is open enough to be passable and is usually characterized by Joshua tree (*Yucca brevifolia*), California buckwheat (*Eriogonum fasciculatum*) and bladderpod (*Peritoma arborea*).

Mojave mixed woody scrub occurs on very shallow, overly drained, and often rolling to steep soils. Sites containing this vegetation have an extremely low water-holding capacity, mild alkalinity, and low salinity. This scrub merges into deeper soils (with a higher water-holding capacity) or at cooler elevations with Great Basin scrub, blackbush scrub, or pinyon woodlands and at warmer elevations with creosote bush scrub.

Within the biological study area, Mojave mixed woody scrub was dominated by a mix of shrubs, including California buckwheat, brittlebush (*Encelia farinosa*), California joint-fir (*Ephedra californica*), rubber rabbitbrush (*Chrysothamnus nauseosus*), California sagebrush (*Artemisia californica*), and chaparral yucca (*Yucca whipplei*). This community often occurs along hillsides along with other shrub communities. Mojave mixed woody scrub can be found along the Cliff Siding Extension segment of the biological study area.

Non-Native Grassland

Non-native grassland can be found throughout the entire biological study area and is described as having a dense to sparse cover of non-native annual grasses. These areas are characterized by a dense to sparse cover of annual grasses, often with interspersed native and non-native annual forbs. This habitat is a disturbance-related community most often found in old fields or openings in native scrub habitats. It favors fine-textured, usually moist clay soils

that can become waterlogged during the winter rainy season and very dry during summer and fall. Typical grasses within the biological study area include foxtail chess (*Bromus madritensis*), ripgut grass (*Bromus diandrus*), wild oat (*Avena* sp.), cheat grass (*Bromus tectorum*), and wheat (*Triticum aestivum*). Characteristic forbs include red-stem filaree (*Erodium cicutarium*), black mustard (*Brassica nigra*), and broad-lobed filaree (*Erodium botrys*).

Environmental Consequences

Build Alternative

Construction and Operational Impacts

Permanent and temporary impacts are being limited to reduce adverse impacts to natural communities. Impacts may include temporary and permanent habitat loss from construction and operation activities. Direct impacts would occur during active construction within the project's physical ground disturbance footprint (right-of-way area for the proposed rail improvements). Table 2.3-1 shows habitat type and the amount of area affected.

Table 2.3-1 Project Impacts to Vegetation Communities

Habitat Type	Total Area in Biological Study Area (acres)	Temporary Impacts to Project Footprint (right-of-way) (Build/Reduced Segment Acres)	Permanent Impacts to Project Footprint (right-of-way) (Build/Reduced Segment Acres)
Blue oak woodland	33.18	0.12	0.02
Foothill pine-oak woodland	16.62	0.00	0.00
Disturbed foothill pine-oak woodland	64.87	0.98	3.15
Mojave mixed woody scrub	21.54	0.72	1.96
Non-native grassland	39.93	1.18	1.65
Developed	11.95	2.02	0.72
Disturbed	14.55	1.28	2.51
Approximate Total	202.64	6.30	10.01

Reduced-Segment Alternative

Impacts would be similar, but less intense, compared to the Build Alternative.

No-Build Alternative

This alternative would not affect natural communities because no project activities would occur. Natural communities within the biological study area would experience no direct or indirect effects.

Avoidance, Minimization, and/or Mitigation Measures

Construction of the project would temporarily and permanently affect natural communities. However, with implementation of the avoidance, minimization, and mitigation measures, no substantial impacts to natural communities are expected.

Minimization Measures

The following measures would avoid and minimize adverse impacts to natural community resources that may occur during project implementation:

- Prior to ground-disturbing activities during the nesting season (February 15 to September 15), a qualified biologist would conduct and submit a preconstruction migratory nesting bird and raptor survey report. The survey must occur prior to initiation of project activities, and any occupied passerine and/or raptor nest occurring within or adjacent to the project footprint would be delineated in the field with an appropriate buffer (typically 200 feet; 500 feet for raptors). To the maximum extent practicable, a minimum buffer zone from occupied nests would be maintained during physical ground-disturbing activities. Once nesting has ended, the buffer may be removed.
- Impacts to 57 oak trees protected under Senate Concurrent Resolution No. 17 would be replaced off-site as part of the Native Vegetation Restoration and Monitoring Plan at an approved off-site mitigation area. This replacement is in conformance with local regulations, including the Kern County Oak Tree Conservation Ordinance. Off-site mitigation would be conducted at a 3:1 ratio for acres of impacts within areas occupied by the 57 oak trees.
- BNSF/UPRR would develop and implement a Native Vegetation Restoration and Monitoring Plan for temporarily-disturbed areas within the biological study area such as staging areas and access roads). The Native Vegetation Restoration and Monitoring Plan would include grading plans to return temporarily-disturbed areas to pre-disturbance topography; native plant palettes including seed mixes and container planting for each affected habitat type; a planting plan and schedule; a monitoring plan and schedule; a maintenance plan and schedule; and performance criteria for determining successful implementation of the plan. The restoration and monitoring plan would be used by BNSF/UPRR after construction activities have been completed. The final plan would be prepared and submitted prior to construction to the appropriate resource agency for approval.
- To avoid attracting predators and nuisance species, the biological study area would be clear of debris, where possible. All food-related trash items must be enclosed in sealed containers and regularly removed.

- BNSF/UPRR would develop and implement a worker environmental education program for employees and contractors working in the biological study area. The program would include descriptions an explanation of the sensitive biological resources associated with the project, explanations of the avoidance and mitigation measures designed to reduce impacts to these resources, descriptions and locations of environmentally sensitive areas, and definitions of the role of workers on-site to prevent impacts to sensitive biological resources.
- Measures to prevent the spread or reintroduction of invasive plant species during construction operations would be used under the direct supervision of the Caltrans district biologist. The re-vegetation of upland areas would incorporate the appropriate native plant species found within the Tehachapi Mountains and be approved in concept by the appropriate resource agency.
- Prior to construction, BNSF/UPRR will stake, flag, fence, or otherwise conspicuously demarcate in the field all environmentally-sensitive areas that are to be protected in place and remain undisturbed during construction. Environmentally sensitive areas include riparian habitat, oak woodlands, aquatic habitat, and any raptor or nesting bird locations identified prior to ground-disturbing activities.
- The project may include a moderate risk that noxious weeds would be introduced and/or spread during construction. As a result, the following best management practices are detailed below:
- Prior to construction, populations of plants listed as invasive exotics by the California Invasive Plant Council in the most recent CalIPC High or Alert list would be identified on the ground and on maps through a preconstruction survey. This would establish a baseline from which to locate equipment washdown stations as well as to evaluate post-construction monitoring surveys.
- All construction equipment must be washed to prevent the spread of invasive weeds from other areas. Clearing and grading equipment must be washed down with high-pressure water.
- Construction personnel would be educated on the importance of controlling and preventing the spread of invasive non-native species infestations. Gravel and/or fill material to be placed in relatively weed-free areas would come from weed-free sources.
- Where practicable and as needed, weed abatement efforts would be targeted to avoid populations of plants listed as invasive exotics in the most recent California Invasive Plant Council High or Alert list.

2.3.2 Wetlands and Other Waters

Special aquatic resource areas were examined within and next to the project's physical disturbance area. Areas suspected of being aquatic resources were evaluated during field delineation surveys.

Regulatory Setting

Wetlands and other waters are protected under a number of laws and regulations. At the federal level, the Federal Water Pollution Control Act, more commonly referred to as the Clean Water Act (33 U.S. Code 1344), is the primary law regulating wetlands and surface waters. One purpose of the Clean Water Act is to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. Waters of the U.S. include navigable waters, interstate waters, territorial seas and other waters that may be used in interstate or foreign commerce. To classify wetlands for the purposes of the Clean Water Act, a three-parameter approach is used that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils formed during saturation/inundation). All three parameters must be present, under normal circumstances, for an area to be designated as a jurisdictional wetland under the Clean Water Act.

Section 404 of the Clean Water Act establishes a regulatory program that provides that discharge of dredged or fill material cannot be permitted if a practicable alternative exists that is less damaging to the aquatic environment or if the nation's waters would be significantly degraded. The Section 404 permit program is run by the U.S. Army Corps of Engineers with oversight by the U.S. Environmental Protection Agency (U.S. EPA).

The U.S. Army Corps of Engineers issues two types of 404 permits: General and Standard permits. There are two types of General permits: Regional permits and Nationwide permits. Regional permits are issued for a general category of activities when they are similar in nature and cause minimal environmental effect. Nationwide permits are issued to allow a variety of minor project activities with no more than minimal effects.

Ordinarily, projects that do not meet the criteria for a Nationwide Permit may be permitted under one of U.S. Army Corps of Engineers' Standard permits. There are two types of Standard permits: Individual permits and Letters of Permission. For Standard permits, the U.S. Army Corps of Engineers' decision to approve is based on compliance with U.S. EPA's Section 404(b) (1) Guidelines (U.S. EPA 40 Code of Federal Regulations Part 230), and whether permit approval is in the public interest. The 404 (b) (1) Guidelines were developed by the U.S. EPA in conjunction with the U.S. Army Corps of Engineers, and allow the discharge of dredged or fill material into the aquatic system (waters of the U.S.) only if there is no practicable alternative which would have less adverse effects. The guidelines state that

the U.S. Army Corps of Engineers may not issue a permit if there is a least environmentally damaging practicable alternative (LEDPA) to the proposed discharge that would have lesser effects on waters of the U.S., and not have any other significant adverse environmental consequences.

The Executive Order for the Protection of Wetlands (EO 11990) also regulates the activities of federal agencies with regard to wetlands. Essentially, this order states that a federal agency, such as the Federal Highway Administration and/or Caltrans, as assigned, cannot undertake or provide assistance for new construction located in wetlands unless the head of the agency finds: 1) that there is no practicable alternative to the construction and 2) the proposed project includes all practicable measures to minimize harm.

At the state level, wetlands and waters are regulated primarily by the State Water Resources Control Board, the Regional Water Quality Control Boards and the California Department of Fish and Wildlife. In certain circumstances, the Coastal Commission (or Bay Conservation and Development Commission or the Tahoe Regional Planning Agency) may also be involved. Sections 1600-1607 of the California Fish and Game Code require any agency that proposes a project that will substantially divert or obstruct the natural flow of or substantially change the bed or bank of a river, stream, or lake to notify the California Department of Fish and Wildlife before beginning construction. If the California Department of Fish and Wildlife determines that the project may substantially and adversely affect fish or wildlife resources, a Lake or Streambed Alteration Agreement will be required. The California Department of Fish and Wildlife jurisdictional limits are usually defined by the tops of the stream or lake banks, or the outer edge of riparian vegetation, whichever is wider. Wetlands under jurisdiction of the U.S. Army Corps of Engineers may or may not be included in the area covered by a Streambed Alteration Agreement obtained from the California Department of Fish and Wildlife.

The Regional Water Quality Control Boards were established under the Porter-Cologne Water Quality Control Act to oversee water quality. Discharges under the Porter-Cologne Act are permitted by Waste Discharge Requirements and may be required even when the discharge is already permitted or exempt under the Clean Water Act. In compliance with Section 401 of the Clean Water Act, the Regional Water Quality Control Boards also issue water quality certifications for activities which may result in a discharge to waters of the U.S. This is most frequently required in tandem with a Section 404 permit request. Please see the Water Quality section for more details.

Affected Environment

A Natural Environmental Study (Minimal Impacts) and Jurisdictional Delineation Report were completed in April, 2012 and revised in January 2013 and May 2013 and have been attached in the Combined Technical Reports document of this Environmental Impact Report (Appendix D).

The biological study area includes portions of the Middle Kern-Upper Tehachapi-Grapevine and Tulare-Buena Vista Lakes Watersheds. A total of 12 features were found in the biological study area. For the purpose of this section, these features have been identified as Feature 1 through Feature 12. Complete details for all features are provided in the Jurisdictional Determination Report. A total of 12 features were found in the biological study area. However, based on correspondence with U.S. Army Corps of Engineers, none of the 12 features identified are potentially jurisdictional. An approved Jurisdictional Delineation is pending completion by the U.S. Army Corps of Engineers.

Environmental Consequences

Build Alternative

Construction and Operational Impacts

The project would result in temporary and permanent impacts to 12 aquatic features, none of which are potentially jurisdictional waters.

Reduced-Segment Alternative

Similar to the Build Alternative, the Reduced-Segment Alternative would not result in impacts to any potentially jurisdictional waters

No-Build Alternative

This alternative would not affect special aquatic resource areas because no activities would occur. Special aquatic resource areas within the biological study area would experience no direct or indirect effects.

Avoidance, Minimization, and/or Mitigation Measures

Minimization Measures

For those areas in the project construction area that may support aquatic resources, the following avoidance and minimization activities would be implemented:

- Before beginning grading activities, BNSF/UPRR would consult with the Regional Water Quality Control Board, U.S. Army Corps of Engineers, and the California Department of Fish and Wildlife to verify the extent of impacts that project construction would have on aquatic resources. BNSF/UPRR would obtain all necessary permits required by the identified agencies before construction.

- Before undertaking ground-disturbing activities within the biological study area that may adversely impact oak woodlands,8 large individual oaks,9 or any other tree species that are equal to or greater than 30 centimeters diameter at breast height or impact 15 meter-wide riparian vegetation corridors along streams and drainages, BNSF/UPRR would coordinate with Kern County to ensure that the project is consistent with any applicable local tree, shrub, plant, and drainage protection requirements.

2.3.3 Plant Species

Regulatory Setting

The U.S. Fish and Wildlife Service and California Department of Fish and Wildlife have regulatory responsibility for the protection of special-status plant species. "Special-status" species are selected for protection because they are rare and/or subject to population and habitat declines. Special status is a general term for species that are provided varying levels of regulatory protection. The highest level of protection is given to threatened and endangered species; these are species that are formally listed or proposed for listing as endangered or threatened under the Federal Endangered Species Act and/or the California Endangered Species Act. Please see Section 2.3.5, Threatened and Endangered Species, in this document for detailed information regarding these species.

This section of the document discusses all the other special-status plant species, including California Department of Fish and Wildlife species of special concern, U.S. Fish and Wildlife Service candidate species, and California Native Plant Society (CNPS) rare and endangered plants.

The regulatory requirements for the Federal Endangered Species Act can be found at 16 U.S. Code Section 1531, et seq. See also 50 Code of Federal Regulations Part 402. The regulatory requirements for the California Endangered Species Act can be found at California Fish and Wildlife Code, Section 2050, et seq. Caltrans projects are also subject to the Native Plant Protection Act, Fish and Wildlife Code, Section 1900-1913 and the California Environmental Quality Act, California Public Resources Code, Sections 2100-21177.

Affected Environment

A Natural Environmental Study (Minimal Impacts) was completed in April 2012 and revised in January 2013 and May 2013. The study is attached to the Combined Technical Reports document of this Environmental Impact Report (Appendix D).

[8] Oak woodlands are characterized by canopy cover by oak trees of at least ten percent (10%), as determined from base line aerial photography or by site survey.

[9] Oaks greater than 15 centimeters diameter at breast height.

Cliff Siding Extension (MP 343.30 to 343.64)

Twenty-five special-status plant species are reported to occur within the U.S. Geological Survey quadrangles containing Cliff Siding Extension. Thirteen of these special-status plant species were determined to have "*Absent"* potential for occurrence designation. Twelve plant species were determined to have "*Habitat Present"* potential for occurrence designation:

- California jewel-flower (Caulanthus californicus)
- Kern County larkspur (Delphinium purpusii)
- Kern mallow (Eremalche kernensis)
- Round-leaved filaree (Erodium macrophyllum)
- Tejon poppy (Eschscholzia lemmonii ssp. kernensis)
- Striped adobe-lily (Fritillaria striata)
- Shevock's golden-aster (Heterotheca shevockii)
- Pale-yellow layia (Layia heterotricha)
- Calico monkeyflower (Mimulus pictus)
- San Joaquin woollythreads (Monolopia congdonii)
- Piute Mountains navarretia (Navarretia setiloba)
- San Joaquin adobe sunburst (Pseudobahia peirsonii)

Focused surveys were done to determine the presence or absence of each species listed above (see Special-Status Focused Plant Survey Report in the appendices of the Natural Environmental Study). The surveys did not identify any of special-status plant species within this segment.

Walong to Marcel (MP 352.07 to 353.08)

Twenty-five special-status plant species are reported to occur within the U.S. Geological Survey quadrangles containing Walong to Marcel. Sixteen of these special-status plant species were determined to have "*Absent"* potential for occurrence designation. Nine plant species were determined to have "*Habitat Present"* potential for occurrence designation:

These species include:

- Palmer's mariposa lily (Calochortus palmeri var. palmeri)
- California jewel-flower (Caulanthus californicus)
- Kern mallow (Eremalche kernensis)

- Round-leaved filaree (Erodium macrophyllum)
- Tejon poppy (Eschscholzia lemmonii ssp. kernensis)
- Striped adobe-lily (Fritillaria striata)
- Pale-yellow layia (Layia heterotricha)
- Flax-like monardella (Monardella linoides ssp. oblonga)
- Piute Mountains navarretia (Navarretia setiloba)

Focused surveys were done to determine the presence or absence of each species listed above (see Special-Status Focused Plant Survey Report, located in the appendices of the Natural Environmental Study). The focused surveys did not identify any of these special-status plant species within this segment.

Environmental Consequences

Build Alternative

Focused special-status plant surveys did not identify any special-status plant species within the biological study area. Project-related impacts to special-status plant species are not expected.

Reduced-Segment Alternative

The focused special-status plant surveys did not identify any special-status plant species within the biological study area. Similar to the Build Alternative, project-related impacts to special-status plant species are not expected.

No-Build Alternative

The project would not be built, and no impacts would occur to any special-status plant species.

Avoidance, Minimization, and/or Mitigation Measures

No action is necessary to specifically address this topic. See Section 2.3.1, Natural Communities, for general measures for biological resources.

2.3.4 Animal Species

Regulatory Setting

Many state and federal laws regulate impacts to wildlife. The U.S. Fish and Wildlife Service, the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) and the California Department of Fish and Wildlife are responsible for implementing these laws. This section discusses potential impacts and permit requirements associated with animals not listed or proposed for listing under the federal or state Endangered Species Act. Species listed or proposed for listing as threatened or

endangered are discussed in Section 2.3.5 below. All other special-status animal species are discussed here, including California Department of Fish and Wildlife fully protected species and species of special concern, and U.S. Fish and Wildlife Service or NOAA Fisheries Service candidate species.

Federal laws and regulations relevant to wildlife include the following:

- National Environmental Policy Act
- Migratory Bird Treaty Act
- Fish and Wildlife Coordination Act
- State laws and regulations relevant to wildlife include the following:
- California Environmental Quality Act
- Sections 1600 – 1603 of the California Fish and Game Code
- Sections 4150 and 4152 of the California Fish and Game Code

Affected Environment

A Natural Environmental Study (Minimal Impacts), completed in April 2012 and revised in January 2013 and May 2013, is attached to the Combined Technical Reports document of this Environmental Impact Report (Appendix D).

Common wildlife species observed within the project site area included a range of commonly-occurring avian species and, to a lesser extent, commonly-occurring mammals, reptiles, amphibians, and invertebrates. Common wildlife species observed are listed in the appendices of the Natural Environmental Study.

Thirty-seven special-status wildlife species are reported to occur within the U.S. Geological Survey quadrangles containing both project segments. All 37 of these special-status wildlife species were determined to have "*Absent"* potential for occurrence designation within the project physical disturbance footprint.

The focused special-status wildlife surveys did not identify any special-status wildlife species within the project area.

Environmental Consequences

Build Alternative

Focused special-status wildlife surveys did not identify any special-status wildlife species within the biological study area. As a result, no project-related impacts to special-status animal species are expected.

Reduced-Segment Alternative

Focused special-status wildlife surveys did not identify any special-status wildlife species within the biological study area. Similar to the Build Alternative, no project-related impacts to special-status animal species are expected.

No-Build Alternative

The project would not be built, and no impacts would occur to any special-status animal species.

Avoidance, Minimization, and/or Mitigation Measures

No action is necessary to specifically address this topic. See Section 2.3.1, Natural Communities, for general measures for biological resources.

2.3.5 Threatened and Endangered Species

Regulatory Setting

The primary federal law protecting threatened and endangered species is the Federal Endangered Species Act: 16 U.S. Code Section 1531, et seq. See also 50 Code of Federal Regulations Part 402. This act and subsequent amendments provide for the conservation of endangered and threatened species and the ecosystems upon which they depend.

Under Section 7 of this act, federal agencies, such as the Federal Highway Administration, are required to consult with the U.S. Fish and Wildlife Service and the National Oceanic and Atmospheric Administration's National Marine Fisheries Service to ensure that they are not undertaking, funding, permitting or authorizing actions likely to jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat. Critical habitat is defined as geographic locations critical to the existence of a threatened or endangered species. The outcome of consultation under Section 7 may include a Biological Opinion with an Incidental Take statement, a Letter of Concurrence and/or documentation of a no effect finding. Section 3 of Federal Endangered Species Act defines take as "harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect or any attempt at such conduct."

California has enacted a similar law at the state level: the California Endangered Species Act (CESA), California Fish and Wildlife Code Section 2050, et seq. The California Endangered Species Act emphasizes early consultation to avoid potential impacts to rare, endangered, and threatened species and to develop appropriate planning to offset project caused losses of listed species populations and their essential habitats.

The California Department of Fish and Wildlife is the agency responsible for implementing California Endangered Species Act. Section 2081 of the Fish and Game Code prohibits

"take" of any species determined to be an endangered species or a threatened species. Take is defined in Section 86 of the Fish and Game Code as "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill." The California Endangered Species Act allows for take incidental to otherwise lawful development projects; for these actions an incidental take permit is issued by California Department of Fish and Wildlife.

For species listed under both Federal Endangered Species Act and California Endangered Species Act requiring a Biological Opinion under Section 7 of the Federal Endangered Species Act, the California Department of Fish and Wildlife may also authorize impacts to California Endangered Species Act species by issuing a Consistency Determination under Section 2080.1 of the Fish and Game Code.

Another federal law, the Magnuson-Stevens Fishery Conservation and Management Act of 1976, was established to conserve and manage fishery resources found off the coast, as well as anadromous species and Continental Shelf fishery resources of the United States, by exercising (A) sovereign rights for exploring, exploiting, conserving, and managing all fish within the exclusive economic zone established by Presidential Proclamation 5030, dated March 10, 1983, and (B) exclusive fishery management authority beyond the exclusive economic zone over such anadromous species, Continental Shelf fishery resources, and fishery resources in special areas.

Affected Environment

A Natural Environmental Study (Minimal Impacts), completed in April 2012 and revised in January 2013 and May 2013, is attached in the Combined Technical Reports document of this Environmental Impact Report (Appendix D).

Common wildlife species observed within the project site area included a range of commonly-occurring avian species and, to a lesser extent, commonly-occurring mammals, reptiles, amphibians, and invertebrates. Common plant species were also observed within the project area. These species are listed in the appendices of the Natural Environmental Study.

No threatened or endangered species are listed within the area, nor were they observed during field visits. It should be noted that five elderberry shrubs are within the Cliff Siding Extension segment. However, these shrubs are outside of the cut and fill areas and considered to be outside of the elevation range of the valley elderberry beetle. Therefore, no impact is anticipated.

Environmental Consequences

Build Alternative

Focused surveys did not identify any threatened or endangered species within the biological study area. No project-related impacts to threatened or endangered species are expected.

Reduced-Segment Alternative

Focused surveys did not identify any threatened or endangered species within the biological study area. Similar to the Build Alternative, no project-related impacts to threatened or endangered species are expected.

No-Build Alternative

The project would not be built, and no threatened or endangered species would be affected.

Avoidance, Minimization, and/or Mitigation Measures

No action is necessary to specifically address this topic. See Section 2.3.1, Natural Communities, for general measures for biological resources.

2.4 Cumulative Impacts

Regulatory Setting

Cumulative impacts are those that result from past, present, and reasonably foreseeable future actions, combined with the potential impacts of this project. A cumulative effect assessment looks at the collective impacts posed by individual land use plans and projects. Cumulative impacts can result from individually minor, but collectively substantial impacts taking place over a period of time.

Cumulative impacts to resources in the project area may result from residential, commercial, industrial, and highway development, as well as from agricultural development and the conversion to more intensive types of agricultural cultivation. These land use activities can degrade habitat and species diversity through consequences such as displacement and fragmentation of habitats and populations, alteration of hydrology, contamination, erosion, sedimentation, disruption of migration corridors, changes in water quality, and introduction or promotion of predators. They can also contribute to potential community impacts identified for the project, such as changes in community character, traffic patterns, housing availability, and employment.

The California Environmental Quality Act Guidelines Section 15130 describes when a cumulative impact analysis is warranted and what elements are necessary for an adequate discussion of cumulative impacts. The definition of cumulative impacts, under the California Environmental Quality Act, can be found in Section 15355 of the California Environmental Quality Act Guidelines. A definition of cumulative impacts, under the National

Environmental Policy Act, is in 40 Code of Federal Regulations Section 1508.7 of the Council on Environmental Quality regulations.

Project-Specifc Resources Considered

In accordance with California Environmental Quality Act Guidelines Section 15130, a list of past, present, and reasonably foreseeable future projects with the potential to produce related or cumulative impacts was developed through consultation with the Kern County Planning Department and the City of Tehachapi Planning Department. Screening criteria were developed for analysis of these projects to determine which projects would be considered speculative versus which would be considered reasonably foreseeable. The criteria included projects that are under active consideration (i.e., projects for which an application has been submitted to an agency or local or regional planning department); projects for which environmental review is complete or under way; projects listed in adopted transportation plans; projects for which permits have been issued; and those projects that a land management agency identified as being "reasonably foreseeable." Thirty-three cumulative projects were identified (see Appendix E), including residential, commercial, industrial, transportation, education, and utility projects. Besides the specific projects on the list, relevant planning documents were reviewed to provide a general context within which to complete the cumulative impact analysis.

It is important to note that the only reasonably foreseeable rail project to be considered in a cumulative assessment is the California High-Speed Train project. As proposed, the California High-Speed Train is an 800-mile electric train system that would ultimately run from San Francisco to San Diego. The California High-Speed Train project is currently focusing on construction of the Initial Operating Segment (IOS) that will operate in the San Joaquin Valley from a point near Fresno to a point near Bakersfield. All available project information and details can be found at http://www.cahighspeedrail.ca.gov.

If a Bakersfield to Palmdale section were to proceed, this section would be southeast of and roughly parallel to State Route 58 and State Route 14. The California High-Speed Train would be within its own right-of-way and would operate independently of the proposed Tehachapi Rail Improvement Project. The conceptual location of the California High-Speed Train in relation to the proposed project is shown in Appendix E.

The California High-Speed Train project is broken into three major project phases: planning, implementation, and service. According to publicly available information on the California High-Speed Train website, the Bakersfield to Palmdale section is currently in Stage 1 planning, analysis of alternatives. The alternatives development and the environmental document for the Bakersfield to Palmdale section of the California High-Speed Trainis

currently being drafted. However, it should be noted that a significant schedule extension and associated slowdown of progress on the Bakersfield to Palmdale section is expected due to the unavailability of construction funding, definition of the power supply system, and exploration by the California High-Speed Train Authority of a revised strategy for implementation of the sections from north to south. Thus, the environmental impacts of the Bakersfield to Palmdale section have not been identified and disclosed. It should be noted that there are no other identified cumulative rail projects that are reasonably foreseeable. Inquiries with the City of Tehachapi and the County of Kern have not yielded any additional projects.

The cumulative project list contains those projects that, when combined with this project, could contribute to cumulative impacts. The combined effects of the cumulative projects were considered for each resource that could be affected by the project to determine whether the impacts would be cumulatively significant. If the combined impacts would be cumulatively significant, then the contribution of the project to the cumulative impact was evaluated to determine whether it would have a cumulatively considerable contribution; if so, mitigation was identified, as appropriate.

The geographic scope of the area potentially affected by the cumulative projects was defined for each resource, as explained in the cumulative analysis below. The geographic study area for each resource represents the geographic area within which the anticipated project impacts may combine with the impacts of other projects, thereby resulting in cumulative impacts. Upon review of available State, Regional and Local documents, the project is not located in an area which has been zoned pursuant to Government Code Section 51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses. The project is also located in a largely rural area and no cultural resources have been identified where project construction is to occur.

Analysis of Cumulative Impacts

This cumulative analysis determines whether the Build Alternative in combination with other approved or foreseeable projects would result in a significant cumulative impact, and, if so, whether the Build Alternative's contribution to the cumulative impact would be considerable. The cumulative analysis is similarly provided for the Reduced-Segment and No-Build Alternatives. The analysis is organized by the project alternatives and then the resource areas presented in the same order as in Sections 2.1 through 2.3.

Build Alternative

Human Environment

Land Use and Planning

The geographic study area for potential cumulative land use impacts encompasses the area within one-half mile of the project. This distance represents the extent of impacts expected by the project that could potentially overlap with the impacts of other projects. Implementation of the project in combination with past, present, and reasonably foreseeable projects could result in significant cumulative land use impacts. Although the impacts of the California High-Speed Train have yet to be determined, it is possible that the California High-Speed Train may result in land use changes or divisions of established communities. Because the project would be next to the existing UPRR right-of-way and would not create new barriers to access through communities or to properties, it would not result in impacts from division of established communities. The land use impacts of the project would be limited, as the amount of land required to be converted from agricultural/grazing uses to rail uses would be minimal (about 5 acres for temporary staging and 1 acre for permanent use), and the additional rail uses would not be incompatible with the existing land uses or any approved land use plans. Therefore, the project's contribution to land use impacts would not be cumulatively considerable.

Growth

The geographic scope for potential cumulative growth impacts encompasses the area within three miles of the Tehachapi Trade Corridor: Morning Drive in Bakersfield to the west and the Tehachapi city limits to the east. Implementation of cumulative projects, such as new housing and roadways, may result in impacts to growth in the study area; however, the implementation of the project is not expected to directly influence growth because the operation of the project would not provide passenger services nor create new or expanded access to the study area. Therefore, the project's contribution to growth impacts would not be cumulatively considerable.

Farmlands

The geographic study area for cumulative farmland impacts encompasses the area within one-half mile of the project. Due to the regional scale of the California High-Speed Train, as well as the potential for other reasonably foreseeable future projects to occur on agricultural lands, it is likely that the cumulative projects could result in significant adverse impacts to farmlands. Because the proposed project would not have any construction or operations impacts related to lands classified as Farmland Mapping and Monitoring Program Farmlands, it would not contribute to impacts on farmlands. The project would, however, require the permanent acquisition of 1.93 acres of non-prime farmlands that are currently under Williamson Act contracts. BNSF would comply with the notification and findings requirements for proposed acquisition of Williamson Act contract lands. The acquisitions would not cause segmentation of agricultural lands, and the project's impacts would be

limited in scope, as only 1.93 acres of farmland would be taken permanently. The project's contribution to farmlands impacts would not be cumulatively considerable.

Public Services

The project would accommodate 10 additional 8,000-foot-long trains per day through the Tehachapi Pass, which could in turn result in minor increases in gate downtimes as discussed in Chapters 2.1.5 and 2.1.6. However, because the project is not near developed areas, it is expected that any increase in the need for or delay of public services during construction or operation of the project would be negligible. Therefore, the project's contribution to public service impacts would not be cumulatively considerable.

Visual/Aesthetics

The geographic area for potential cumulative impacts to visual resources comprises the areas from which the project would be within sensitive public views. There are no viewsheds of designated scenic vistas, highways, or corridors within the study area. Based on field observations described in Section 2.1.7, areas with sensitive public views would be limited to a short section of the Walong to Marcel segment, mainly from a turnout along Woodford-Tehachapi Road near the Tehachapi Loop (see Figure 2.2-7); no public views were identified along the Cliff Siding Extension. Changes in views from the project would be consistent with the existing environment.

The California High-Speed Train may contribute to cumulative visual impacts in this study area, and it is possible that its impacts could combine with those generated by the project to result in cumulative impacts to visual resources. However, the distance between the project and the California High-Speed Train averages one-half mile, and while viewers in the study area may be able to see passing trains in the distance, these views would be short-term and temporary.

Sources of nighttime light and glare in the rural study area are few but include light and glare from front locomotives. However, railroad activities have been an inherent part of the landscape for over 130 years, and the intermittent sweep of lights from passing locomotives occurring at night is considered an integral part of the existing landscape character. Because lighting is only installed on the lead locomotives, the increase in the number of locomotives as a result of the project would not result in a significant change to the nighttime character, as they would not result in additional light sources. Therefore, impacts to visual resources resulting from implementation of the project would not be cumulatively considerable.

Physical Environment

Hydrology and Floodplain

The geographic scope for potential cumulative impacts to hydrology and floodplains comprises the area in which Army Corps of Engineers, Regional Water Quality Control Board, and California Department of Fish and Wildlife jurisdiction was assessed and quantified. The study area includes the project's proposed physical ground disturbance footprint in addition to portions of the Middle Kern-Upper Tehachapi-Grapevine Watershed. Within this area, the California High-Speed Train is the only cumulative project that could contribute to cumulative hydrology and floodplains impacts. This is due to its size and potential to impact undisturbed land.

Potential impacts from the Build Alternative would mainly occur during construction and would include grading activities such as embankment fills and slope cuts, as well as expansion of the existing culverts to handle the larger railroad right-of-way. Drainage flows and patterns could be temporarily affected if rain events occur during grading activities. However, project activities would not result in any major alterations to the drainage pattern geometry, nor would they alter the water surface elevation level or change the floodplain boundary of the study area.

The project and the other cumulative projects would be required to implement best management practices and minimization measures to prevent potential impacts to hydrology and floodplains. Therefore, because potential impacts generated by construction of the cumulative projects would be temporary, of limited extent, and addressed through best management practices, the cumulative impacts to hydrology and floodplains would not be cumulatively considerable.

Water Quality

The geographic area analyzed for potential cumulative water quality impacts is the southern portion of the Regional Water Quality Control Board's Central Valley Region Basin Plan, within the Middle Kern-Upper Tehachapi-Grapevine and Tulare-Buena Vista Lakes Watersheds (see Figure 2.2-1). Within this area, the California High-Speed Train is the only project with the potential to contribute to cumulative water quality impacts. Impacts generated by the California High-Speed Train are expected to be similar to those generated by the project, which would be the potential release of pollutants such as floating material, oil and grease, and sediment during construction. It is expected that potential temporary construction impacts from the project and the California High-Speed Train could be eliminated through the use of best management practices outlined in each project's Storm Water Pollution Prevention Plan. During operations, any increase in maintenance activities associated with the limited increase in railroad activity is not expected to result in substantial

impacts to water quality. Therefore, because each project would reduce potential water quality impacts to *de minimus* levels, cumulative impacts would not be cumulatively considerable.

Geology/Soils/Seismic/Topography

The geographic scope for potential cumulative geologic, seismic, or soils impacts encompasses the project study area. No cumulative projects were identified within this area.

Because the project would not have substantial impacts pertaining to geology, soils, seismicity, and topography, and it would not combine with other cumulative projects in the study area to expose people or structures to any greater risks of fault rupture or ground shaking, the impacts in these issue areas would not be cumulatively considerable.

Paleontology

The geographic area analyzed for potential cumulative paleontological impacts encompasses the three geologic units that underlie the project. No cumulative projects were identified.

Results of the mapping analyses indicate the probability for each of these substrates to contain significant paleontological resources ranges from “low” to “no probability.” The paleontological record search supports this finding in that no known fossil locations have been recorded within the study area. Impacts to paleontological resources would not be cumulatively considerable.

Hazardous Waste or Materials

The geographic scope for potential cumulative impacts related to hazardous waste or materials is up to one mile from the project study area, as this is the area that could potentially be exposed to hazardous waste or materials during project construction or operation. However, no cumulative projects were identified in this area.

Air Quality

The project is within the Tehachapi Pass and extends through portions of both the Eastern Kern Air Pollution Control District and the San Joaquin Valley Air Pollution Control District. The geographic scope for potential cumulative air quality impacts encompasses the area within three miles of the Tehachapi Trade Corridor from Morning Drive in Bakersfield to the west and the City of Tehachapi limits to the east. Construction and operation of the cumulative projects within the study area, including the California High-Speed Train, residential development, roadway improvements, public facilities development and renewable energy projects, and the Build Alternative could result in significant cumulative impacts to air quality in the study area.

Results of the air quality analysis indicate that implementation of the Build Alternative would generate air pollutants primarily through exhaust from construction equipment and fugitive dust emissions. However, these temporary construction impacts would be reduced through the use of best management practices set forth in the project's dust control plan and adherence to air district regulations. Furthermore, operation of the project would result in reduced greenhouse gas emissions and a net benefit to air quality in the study area through improvements to operational efficiency for rail operations in the Tehachapi Pass; lower freight transportation emissions associated with trains compared to trucks; less air pollution from roadway maintenance activities; and expected reductions in traffic congestion from fewer trucks being on the road. Therefore, because the project would reduce construction-related emissions to *de minimus* levels and result in beneficial impacts during operations, the project's contribution to air quality would not be cumulatively considerable.

Noise and Vibration

The geographic scope for potential cumulative impacts related to noise and vibration encompasses the area where the sensitive receptors near the project are located. This includes properties next to the existing UPRR right-of-way such as the National Chavez Center about 3.75 miles southeast of the Cliff Siding Extension and 3.10 miles northwest of the Walong to Marcel segment and portions of the city of Tehachapi 7.24 miles southeast of the Cliff Siding Extension and 6.2 miles northwest of the Walong to Marcel Segment. Construction noise would be temporary and is not expected to be significant because of the distances between project locations and the staggered construction periods. However, operation of the cumulative projects, particularly the California High-Speed Train, could potentially result in significant cumulative noise impacts by introducing an additional source of rail noise to sensitive receptors that are not currently located along a transportation (or railroad) corridor.

During construction of the Build Alternative, noise increases of up to 7 decibels could occur at sensitive receptors in the study area. This level is classified as a "no impact" increase by the Federal Transit Administration's Prescriptive Construction Noise Impact Guidelines (levels over 90 decibels considered a substantial impact). Vibration from construction activities at the nearest sensitive properties would be imperceptible.

Railway noise level increases during operation of the project would range between 0.1 and 1.0 decibel, which would not be considered an impact. Similarly, increases in vibration resulting from implementation of the project are anticipated to range from non-existent to negligible. Therefore, the project would not have a cumulatively considerable contribution to noise and vibration impacts in the study area.

Biological Resources

The geographic study area for potential cumulative biological impacts comprise the area within one mile of the project. This distance represents the extent of impacts anticipated by the project that could potentially overlap with the impacts of other projects. Within this area, the California High-Speed Train may also contribute to cumulative impacts to biological resources. Because of the regional scale of the California High-Speed Train, it is possible that the cumulative projects could combine to result in significant impacts to biological resources.

Impacts resulting from the project would include temporary and permanent loss of natural habitat from construction and operation activities, expected to be about 6.3 and 10.01 acres of temporary and permanent impacts, respectively. These natural communities are not considered of special status. With the minimization measures, impacts to natural communities would be reduced to *de minimus*. No special-status species were detected during on-site biological surveys.

Minimization measures would ensure that impacts resulting from the project would be reduced to *de minimus* levels, the project's contribution to biological resource impacts in the study area would not be cumulatively considerable.

Reduced-Segment Alternative

The Reduced-Segment Alternative would not double-track the Cliff Siding Extension. As such, there would be no cumulatively considerable impacts under this alternative for the same reasons provided in the Build Alternative cumulative impact analysis.

2.5 Climate Change

Climate change refers to long-term changes in temperature, precipitation, wind patterns, and other elements of the earth's climate system. An ever-increasing body of scientific research attributes these climatological changes to greenhouse gases, particularly those generated from the production and use of fossil fuels.

While climate change has been a concern for several decades, the establishment of the Intergovernmental Panel on Climate Change (IPCC) by the United Nations and World Meteorological Organization in 1988 has led to increased efforts devoted to greenhouse gas (GHG) emissions reduction and climate change research and policy. These efforts are primarily concerned with the emissions of GHGs generated by human activity including carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), tetrafluoromethane, hexafluoroethane, sulfur hexafluoride (SF_6), HFC-23 (fluoroform), HFC-134a (s, s, s, 2-tetrafluoroethane), and HFC-152a (difluoroethane).

In the U.S., the main source of GHG emissions is electricity generation, followed by transportation. In California, however, transportation sources make up the largest source of GHG-emitting sources. The dominant GHG emitted is CO_2, mostly from fossil fuel combustion.

There are typically two terms used when discussing the impacts of climate change: "Greenhouse Gas Mitigation" and "Adaptation." "Greenhouse Gas Mitigation" is a term for reducing GHG emissions to reduce or "mitigate" the impacts of climate change. "Adaptation" refers to the effort of planning for and adapting to impacts resulting from climate change (such as adjusting transportation design standards to withstand more intense storms and higher sea levels)[10].

There are four primary strategies for reducing GHG emissions from transportation sources: 1) improving the transportation system and operational efficiencies, 2) reducing travel activity, 3) transitioning to lower GHG-emitting fuels, and 4) improving vehicle technologies/efficiency. To be most effective, all four strategies should be pursued cooperatively. [11]

Regulatory Setting

State

With the passage of several pieces of legislation including State Senate and Assembly bills and Executive Orders, California launched an innovative and proactive approach to dealing with GHG emissions and climate change.

Assembly Bill 1493 (AB 1493), Pavley, Vehicular Emissions: Greenhouse Gases, 2002: This bill requires the California Air Resources Board (ARB) to develop and implement regulations to reduce automobile and light truck GHG emissions. These stricter emissions standards were designed to apply to automobiles and light trucks beginning with the 2009-model year.

Executive Order (EO) S-3-05 (June 1, 2005): The goal of this EO is to reduce California's GHG emissions to 1) year 2000 levels by 2010, 2) year 1990 levels by 2020, and 3) 80 percent below the year 1990 levels by 2050. In 2006, this goal was further reinforced with the passage of Assembly Bill 32.

Assembly Bill 32 (AB 32), Núñez and Pavley, The Global Warming Solutions Act of 2006: AB 32 sets the same overall GHG emissions reduction goals as outlined in EO S-3-05, while further mandating that ARB create a scoping plan and implement rules to achieve "real, quantifiable, cost-effective reductions of greenhouse gases."

[10] http://climatechange.transportation.org/ghg_mitigation/

[11] http://www.fhwa.dot.gov/environment/climate_change/mitigation/

Executive Order S-20-06 (October 18, 2006): This order establishes the responsibilities and roles of the Secretary of the California Environmental Protection Agency (Cal/EPA) and state agencies with regard to climate change.

Executive Order S-01-07 (January 18, 2007): This order set forth the low carbon fuel standard for California. Under this EO, the carbon intensity of California's transportation fuels is to be reduced by at least 10 percent by 2020.

Senate Bill 97 (SB 97) Chapter 185, 2007, Greenhouse Gas Emissions: This bill required the Governor's Office of Planning and Research (OPR) to develop recommended amendments to the California Environmental Quality Act (CEQA) Guidelines for addressing GHG emissions. The amendments became effective on March 18, 2010.

Senate Bill 375 (SB 375), Chapter 728, 2008, Sustainable Communities and Climate Protection: This bill requires the California Air Resources Board (CARB) to set regional emissions reduction targets from passenger vehicles. The Metropolitan Planning Organization (MPO) for each region must then develop a "Sustainable Communities Strategy" (SCS) that integrates transportation, land-use, and housing policies to plan for the achievement of the emissions target for their region.

Senate Bill 391 (SB 391) Chapter 585, 2009 California Transportation Plan: This bill requires the State's long-range transportation plan to meet California's climate change goals under AB 32.

Federal

Although climate change and GHG reduction are a concern at the federal level, currently no regulations or legislation have been enacted specifically addressing GHG emissions reductions and climate change at the project level. Neither the United States Environmental Protection Agency (U.S. EPA) nor the Federal Highway Administration (FHWA) has issued explicit guidance or methods to conduct project-level GHG analysis. [12] FHWA supports the approach that climate change considerations should be integrated throughout the transportation decision-making process–from planning through project development and delivery. Addressing climate change mitigation and adaptation up front in the planning process will assist in decision-making and improve efficiency at the program level, and will inform the analysis and stewardship needs of project-level decision-making. Climate change considerations can be integrated into many planning factors, such as supporting economic vitality and global efficiency, increasing safety and mobility, enhancing the environment, promoting energy conservation, and improving the quality of life.

[12] To date, no national standards have been established regarding mobile source GHGs, nor has U.S. EPA established any ambient standards, criteria or thresholds for GHGs resulting from mobile sources.

The four strategies outlined by FHWA to lessen climate change impacts correlate with efforts that the state is undertaking to deal with transportation and climate change; these strategies include improved transportation system efficiency, cleaner fuels, cleaner vehicles, and a reduction in travel activity.

Climate change and its associated effects are also being addressed through various efforts at the federal level to improve fuel economy and energy efficiency, such as the "National Clean Car Program" and EO 13514 - *Federal Leadership in Environmental, Energy and Economic Performance*.

Executive Order 13514 (October 5, 2009): This order is focused on reducing greenhouse gases internally in federal agency missions, programs and operations, but also directs federal agencies to participate in the Interagency Climate Change Adaptation Task Force, which is engaged in developing a national strategy for adaptation to climate change.

U.S. EPA's authority to regulate GHG emissions stems from the U.S. Supreme Court decision in *Massachusetts v. EPA* (2007). The Supreme Court ruled that GHGs meet the definition of air pollutants under the existing Clean Air Act and must be regulated if these gases could be reasonably anticipated to endanger public health or welfare. Responding to the Court's ruling, U.S. EPA finalized an endangerment finding in December 2009. Based on scientific evidence it found that six greenhouse gases constitute a threat to public health and welfare. Thus, it is the Supreme Court's interpretation of the existing Act and EPA's assessment of the scientific evidence that form the basis for EPA's regulatory actions. U.S. EPA in conjunction with NHTSA issued the first of a series of GHG emission standards for new cars and light-duty vehicles in April 2010.[13]

The U.S. EPA and the National Highway Traffic Safety Administration (NHTSA) are taking coordinated steps to enable the production of a new generation of clean vehicles with reduced GHG emissions and improved fuel efficiency from on-road vehicles and engines. These next steps include developing the first-ever GHG regulations for heavy-duty engines and vehicles, as well as additional light-duty vehicle GHG regulations.

The final combined standards that made up the first phase of this national program apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles, covering model years 2012 through 2016. The standards implemented by this program are expected to reduce GHG emissions by an estimated 960 million metric tons and 1.8 billion barrels of oil over the lifetime of the vehicles sold under the program (model years 2012-2016).

[13] http://www.c2es.org/federal/executive/epa/greenhouse-gas-regulation-faq

On August 28, 2012, U.S. EPA and NHTSA issued a joint Final Rulemaking to extend the National Program for fuel economy standards to model year 2017 through 2025 passenger vehicles. Over the lifetime of the model year 2017-2025 standards this program is projected to save approximately four billion barrels of oil and two billion metric tons of GHG emissions.

The complementary U.S. EPA and NHTSA standards that make up the Heavy-Duty National Program apply to combination tractors (semi trucks), heavy-duty pickup trucks and vans, and vocational vehicles (including buses and refuse or utility trucks). Together, these standards will cut greenhouse gas emissions and domestic oil use significantly. This program responds to President Barack Obama's 2010 request to jointly establish greenhouse gas emissions and fuel efficiency standards for the medium- and heavy-duty highway vehicle sector. The agencies estimate that the combined standards will reduce CO_2 emissions by about 270 million metric tons and save about 530 million barrels of oil over the life of model year 2014 to 2018 heavy duty vehicles.

Project Analysis

An individual project does not generate enough GHG emissions to significantly influence global climate change. Rather, global climate change is a cumulative impact. This means that a project may contribute to a potential impact through its *incremental* change in emissions when combined with the contributions of all other sources of GHG.[14] In assessing cumulative impacts, it must be determined if a project's incremental effect is "cumulatively considerable" (CEQA Guidelines Sections 15064(h)(1) and 15130). To make this determination, the incremental impacts of the project must be compared with the effects of past, current, and probable future projects. To gather sufficient information on a global scale of all past, current, and future projects to make this determination is a difficult, if not impossible, task. The AB 32 Scoping Plan mandated by AB 32 includes the main strategies California will use to reduce GHG emissions. As part of its supporting documentation for the Draft Scoping Plan, the ARB released the GHG inventory for California (forecast last updated: October 28, 2010). The forecast is an estimate of the emissions expected to occur in 2020 if none of the foreseeable measures included in the Scoping Plan were implemented. The base year used for forecasting emissions is the average of statewide emissions in the GHG inventory for 2006, 2007, and 2008.

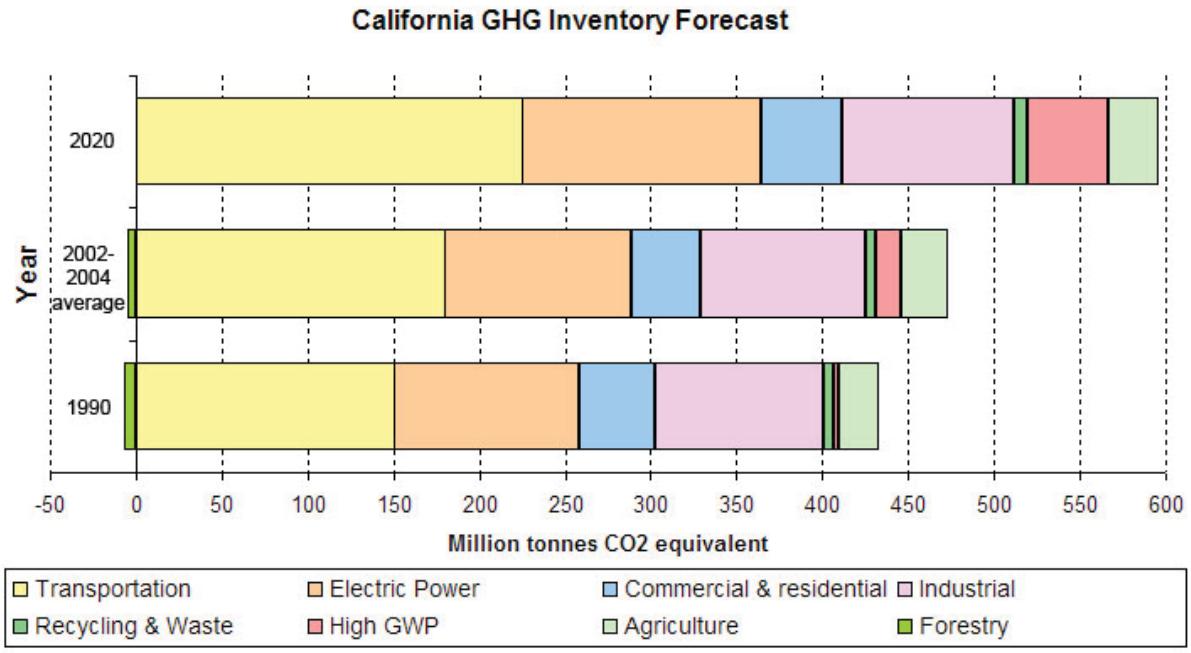
There are several unique challenges to analyzing greenhouse gas emissions and climate change under the California Environmental Quality Act (CEQA), largely because of climate change's "global" nature. Typical CEQA analyses address local actions that have local - or, at most,

[14] This approach is supported by the AEP: *Recommendations by the Association of Environmental Professionals on How to Analyze GHG Emissions and Global Climate Change in CEQA Documents* (March 5, 2007), as well as the South Coast Air Quality Management District (Chapter 6: The CEQA Guide, April 2011) and the U.S. Forest Service (Climate Change Considerations in Project Level NEPA Analysis, July 13, 2009).

regional - impacts, whereas climate change presents the considerable challenge of analyzing the relationship between local activities and the resulting potential, if any, for global environmental impacts. Most environmental analyses examine the "project-specific" impacts that a particular project is likely to generate. With regard to global warming, however, it is generally accepted that while the magnitude of global warming effects is substantial, the contribution of an individual general development project is so small that direct project-specific significant impacts are highly unlikely. Climate change is a global and, thus, cumulative impact.

Global climate change is also fundamentally different from other types of air quality impact analyses under CEQA in which the impacts are all measured within, and are linked to, a discrete region or area. Instead, a global climate change analysis must be considered on a global level, rather than the typical local or regional setting, and requires consideration of not only emissions from the project under consideration, but also the extent of the displacement, translocation, and redistribution of emissions. In the usual context, where air quality is linked to a particular location or area, it is appropriate to consider the creation of new emissions in that specific area to be an environmental impact whether or not the emissions are truly "new" emissions to the overall globe. When the impact is a global one, however, it makes more sense to consider whether the emissions really are new emissions, or are merely being moved from one place to another. For example, the approval of a rail or transportation project does not necessarily create new automobile drivers. Rather, due to the “relocation” factor, existing mobile emissions are often simply redistributed; accordingly, the use of models that measure overall emissions increases without accounting for existing emissions will substantially overstate the impact of the development project on global warming. This makes an accurate analysis of GHG emissions substantially different from other air quality impacts, where the “addition” of redistributed emissions to a new locale can make a substantial difference to overall air quality.

Figure 2.5-1 California Greenhouse Gas Inventory



Source: http://www.arb.ca.gov/cc/inventory/data/forecast.htm

The Department and its parent agency, the Transportation Agency, have taken an active role in addressing GHG emission reduction and climate change. Recognizing that 98 percent of California's GHG emissions are from the burning of fossil fuels and 40 percent of all human made GHG emissions are from transportation, the Department has created and is implementing the Climate Action Program at Caltrans that was published in December 2006.15

One of the strategies in the AB 32 Scoping Plan relates to "goods movement" and provides:

> "A significant portion of greenhouse gas emissions from transportation activities comes from the movement of freight or goods throughout the state. Activity at California ports is forecast to increase by 250 percent between now and 2020. Both the Goods Movement Emission Reduction Plan (GMERP)[16] and the 2007 State Implementation Plan (SIP) contain numerous measures designed to reduce the public health impact of goods movement activities in California. ARB has already adopted a regulation to require ship electrification at ports. Proposition 1B funds, as well as clean air plans being

[15] Caltrans Climate Action Program is located at the following web address: http://www.dot.ca.gov/hq/tpp/offices/ogm/key_reports_files/State_Wide_Strategy/Caltrans_Climate_Action_Program.pdf

[16] Proposition 1B: Goods Movement Emission Reduction Program (Program) is a partnership between the State Air Resources Board (ARB) and local agencies (like air districts and seaports) to quickly reduce air pollution emissions and health risk from freight movement along California's trade corridors (map). Local agencies apply to ARB for funding, then those agencies offer financial incentives to owners of equipment used in freight movement to upgrade to cleaner technologies.

> implemented by California's ports, will also help reduce greenhouse gas emissions while cutting criteria pollutant and toxic diesel emissions. ARB is proposing to develop and implement additional measures to reduce greenhouse gas emissions due to goods movement from trucks, ports and other related facilities. The anticipated reductions would be above and beyond what is already expected in the GMERP and the SIP. This effort should provide accompanying reductions in air toxics and smog forming emissions." (2008 ARB 32 Scoping Plan, p. 52).

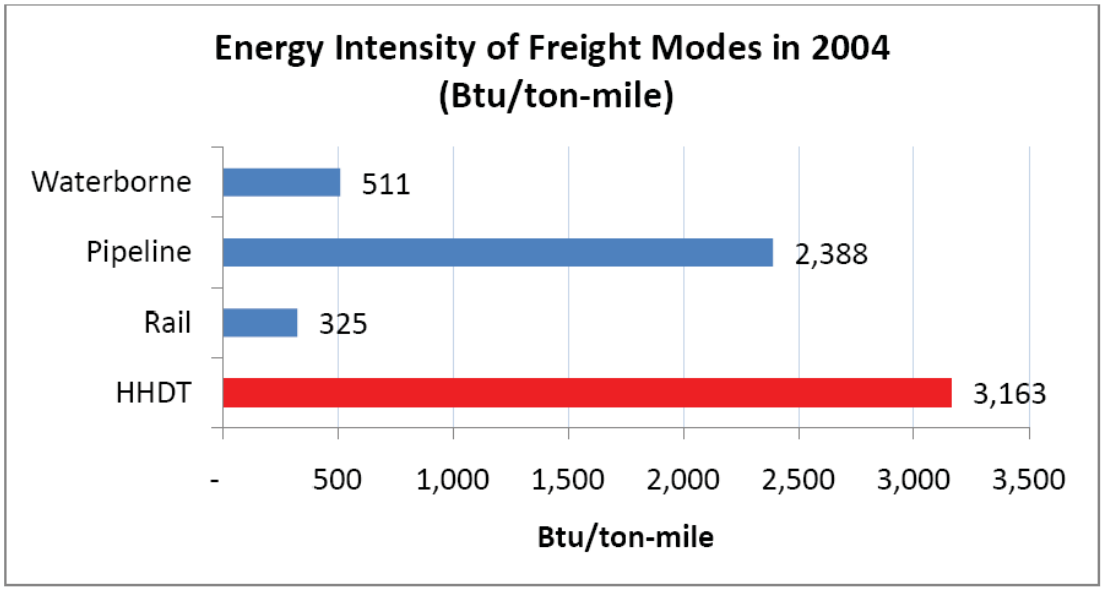
As discussed further herein, the project is funded by Proposition 1B funds, which were designated to reduce congestion and improve air quality. The project is consistent with the goods movement strategy outlined in the AB 32 Scoping Plan by increasing efficiency in the movement of freight.

In addition to furthering the target GHG reductions identified within the AB 32 Scoping Plan, the project is also consistent with the 2006 Climate Action Team Report measures to improve transportation efficiency, particularly with regard to the "Smart Land Use and Intelligent Transportation Measure," which provides as follows, in relevant part: Smart Land Use and Intelligent Transportation. "Intelligent Transportation Systems (ITS) is the application of advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods and services. Smart growth/land use and ITS would minimize the need for major capital improvements and can provide a host of benefits including more livable communities, transportation energy efficiency, lower emissions from mobile sources, and a lower-cost provision of public services (e.g., sewer, water).

Consistent with the goals of AB32, one of the main strategies in Caltrans' Climate Action Program to reduce GHG emissions is to make California's transportation system more efficient. One strategy is to reduce emissions through mode shift onto more efficient mode of transportation. Trains provide an economical means of transporting bulk goods over long distances. There is a demand in fuel consumption by the engines; however, their ability to haul large amounts of cargo makes for an overall low energy requirement per unit of weight when compared to truck or air transport (Kern County 2011 Regional Transportation Plan). Figure 2.5-2 shows that hauling freight by rail is 10 times more energy efficient than shipping by truck (Kern County and San Joaquin 2011 Regional Transportation Plans). Figure 2.5-3 shows that, according to the California State Rail Plan, hauling freight by rail is also emits around 10 times less emissions than by shipping by truck[17].

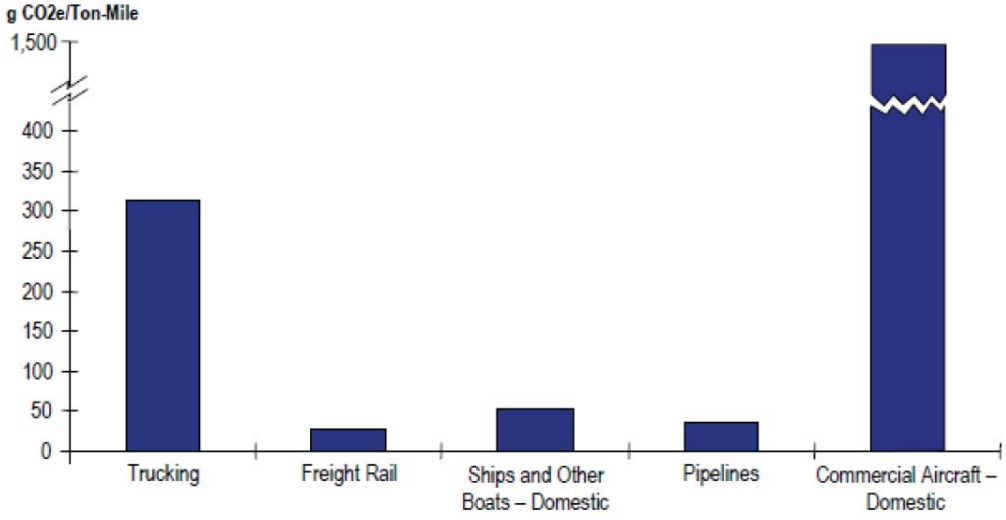
[17] http://californiastaterailplan.dot.ca.gov/docs/csrp_public-draft_main_2013-02-09.pdf

Figure 2.5-2 Energy Efficiency by Transport Modes



From: ICFI, "Greenhouse Gas Emissions from Freight Trucks", International Emissions Inventory Conference May 16, 2007

Figure 2.5-3 GHG Emissions per Freight Ton-Mile by Freight Transportation Mode, 2006[18]



Source: California 2013 Draft State Rail Plan

Operational Impacts

Operational emissions may consist of regular maintenance of the railroad track additions as well as fuel and electricity usage. The proposed Build Alternative would increase rail

[18] http://californiastaterailplan.dot.ca.gov/docs/csrp_public-draft_main_2013-02-09.pdf

capacity in the Tehachapi Trade Corridor. The project would develop rail infrastructure to accommodate an average increase of 550 containers per day. The project would also increase the capacity from 50 to 56 trains per day as well as an increase in train length to accommodate a greater proportion of 8,000 feet trains. If the Build Alternative were not to be built, the additional demand for freight transport that would have been met by the longer additional trains would be otherwise met freight trucks or would not met at all depending on the type of freight transported potentially affecting economic growth. It is uncertain as to the degree to which unmet future demand for freight transport in the Tehachapi Trade Corridor would be diverted to trucks or other modes.

In the case that the majority of additional freight transport is diverted to trucks, as shown in Figure 2.5.3, freight transport by rail would also emit nearly 10 times less GHGs than trucks on a per ton-mile basis. This would result in freight being transported at lower emissions rates per mile by rail as compared to by truck. Diversion of freight transport to rail from trucks may also result in less traffic congestion on roadways, which would reduce vehicle idling time and increase average vehicle speeds. This reduction in vehicle idling time and increase in average vehicle speed may result in a reduction in the emissions of GHGs.

Because of the uncertainty pertaining to the actual tonnage of additional freight demand, any indirect impacts on roadway congestion, and the actual mode-shift that will occur under project conditions, a qualitative conclusion is discussed regarding the operational impacts of the project on GHG emissions.

Construction Impacts

Greenhouse gas emissions for transportation projects can be divided into those produced during construction and those produced during operations. Construction GHG emissions include emissions produced as a result of material processing, emissions produced by onsite construction equipment, and emissions arising from traffic delays due to construction. These emissions will be produced at different levels throughout the construction phase; their frequency and occurrence can be reduced through innovations in plans and specifications and by implementing better traffic management during construction phases.

The proposed project would require cutting slopes, adding bridges, and extend culverts involving a cut and fill earthwork. Construction activities would consist of grading, filling, ground clearance, and staging of equipment throughout the project vicinity for construction vehicles and supplies.

The Urban Emissions Model created by the state Air Resources Board was used to estimate potential construction emissions and is included in Table 2.4-1 Project Construction Emissions.

Measures included to reduce air quality impacts will also reduce GHG emissions.

CEQA Conclusion

While the project will result in GHG emissions during construction, it is anticipated that the project will not result in any increase in operational GHG emissions. While it is Caltrans determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct impact and its contribution on the cumulative scale to climate change, Caltrans is firmly committed to implementing measures to help reduce GHG emissions. These measures are outlined in the following section.

Greenhouse Gas Reduction Strategies

The Department continues to be involved on the Governor's Climate Action Team as the ARB works to implement Executive Orders S-3-05 and S-01-07 and help achieve the targets set forth in AB 32. Many of the strategies the Department is using to help meet the targets in AB 32 come from then-Governor Arnold Schwarzenegger's Strategic Growth Plan for California. The Strategic Growth Plan targeted a significant decrease in traffic congestion below 2008 levels and a corresponding reduction in GHG emissions, while accommodating growth in population and the economy. The Strategic Growth Plan relies on a complete systems approach to attain CO_2 reduction goals: system monitoring and evaluation, maintenance and preservation, smart land use and demand management, and operational improvements as shown in Figure 2.5.4: The Mobility Pyramid.

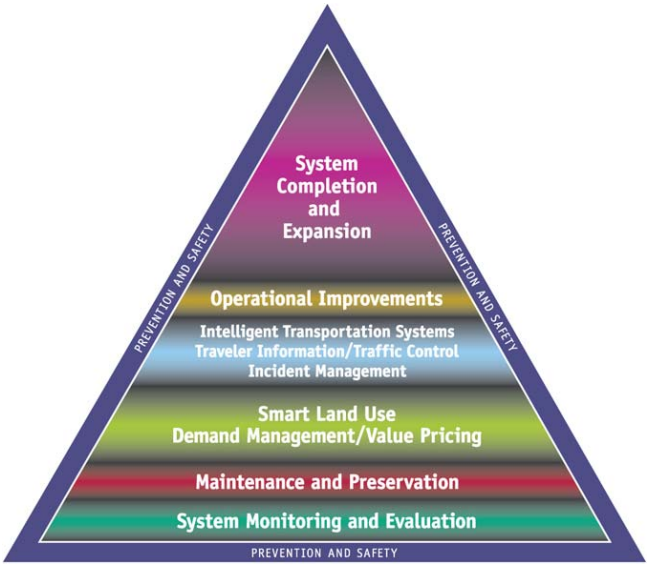


Figure 2.5.4 Mobility Pyramid

The Department is supporting efforts to reduce vehicle miles traveled by planning and implementing smart land use strategies: job/housing proximity, developing transit-oriented communities, and high-density housing along transit corridors. The Department works closely with local jurisdictions on planning activities, but does not have local land use planning

authority. The Department assists efforts to improve the energy efficiency of the transportation sector by increasing vehicle fuel economy in new cars, light and heavy-duty trucks; the Department is doing this by supporting ongoing research efforts at universities, by supporting legislative efforts to increase fuel economy, and by participating on the Climate Action Team. It is important to note, however, that control of fuel economy standards is held by the U.S. EPA and ARB.

The Department is also working towards enhancing the State's transportation planning process to respond to future challenges. Similar to requirements for regional transportation plans under Senate Bill (SB) 375 (Steinberg 2008), SB 391(Liu 2009) requires the State's long-range transportation plan to meet California's climate change goals under Assembly Bill (AB) 32.The California Transportation Plan (CTP) is a statewide, long-range transportation plan to meet our future mobility needs and reduce greenhouse gas (GHG) emissions. The CTP defines performance-based goals, policies, and strategies to achieve our collective vision for California's future, statewide, integrated, multimodal transportation system.

The purpose of the CTP is to provide a common policy framework that will guide transportation investments and decisions by all levels of government, the private sector, and other transportation stakeholders. Through this policy framework, the CTP 2040 will identify the statewide transportation system needed to achieve maximum feasible GHG emission reductions while meeting the State's transportation needs.

Table 2.4.2 summarizes the Departmental and statewide efforts that the Department is implementing to reduce GHG emissions. More detailed information about each strategy is included in the Climate Action Program at Caltrans (December 2006).

Table 2.4.2 Climate Change/CO2 Reduction Strategies

Strategy	Program	Partnership		Method/Process	Estimated CO2 Savings Million Metric Tons (MMT)	
		Lead	Agency		2010	2020
Smart Land Use	Intergovernmental Review (IGR)	Caltrans	Local governments	Review and seek to mitigate development proposals	Not Estimated	Not Estimated
	Planning Grants	Caltrans	Local and regional agencies & other stakeholders	Competitive selection process	Not Estimated	Not Estimated
	Regional Plans and Blueprint Planning	Regional Agencies	Caltrans	Regional plans and application process	0.975	7.8
Operational Improvements & Intelligent Transportation System (ITS) Deployment	Strategic Growth Plan	Caltrans	Regions	State ITS; Congestion Management Plan	0.07	2.17
Mainstream Energy & GHG into Plans and Projects	Office of Policy Analysis & Research; Division of Environmental Analysis	Interdepartmental effort		Policy establishment, guidelines, technical assistance	Not Estimated	Not Estimated
Educational & Information Program	Office of Policy Analysis & Research	Interdepartmental, CalEPA, ARB, CEC		Analytical report, data collection, publication, workshops, outreach	Not Estimated	Not Estimated
Fleet Greening & Fuel Diversification	Division of Equipment	Department of General Services		Fleet Replacement B20 B100	0.0045	0.0065 0.045 0.0225
Non-vehicular Conservation Measures	Energy Conservation Program	Green Action Team		Energy Conservation Opportunities	0.117	0.34
Portland Cement	Office of Rigid Pavement	Cement and Construction Industries		2.5 % limestone cement mix 25% fly ash cement mix > 50% fly ash/slag mix	1.2 0.36	4.2 3.6
Goods Movement	Office of Goods Movement	Cal EPA, ARB, BT&H, MPOs		Goods Movement Action Plan	Not Estimated	Not Estimated
Total					2.72	18.18

Caltrans Director's Policy 30 (DP-30) Climate Change (June 22, 2012): is intended to establish a Department policy that will ensure coordinated efforts to incorporate climate change into Departmental decisions and activities.

Caltrans Activities to Address Climate Change (April 2013)[19] provides a comprehensive overview of activities undertaken by Caltrans statewide to reduce greenhouse gas emissions resulting from agency operations.

The following measures will also be included in the project to reduce the GHG emissions and potential climate change impacts from the project:

Sample GHG reduction measures:

1. The Department and the California Highway Patrol are working with regional agencies to implement Intelligent Transportation Systems (ITS) to help manage the efficiency of the existing highway system. ITS commonly consists of electronics, communications, or information processing used singly or in combination to improve the efficiency or safety of a surface transportation system.

2. Landscaping reduces surface warming and, through photosynthesis, decreases CO_2. Measures included in the proposed project mitigation and minimization measures to replace oak trees for Biological and Aesthetic impacts will also help offset any potential CO_2 emissions.

Adaptation Strategies

"Adaptation strategies" refer to how the Department and others can plan for the effects of climate change on the state's transportation infrastructure and strengthen or protect the facilities from damage. Climate change is expected to produce increased variability in precipitation, rising temperatures, rising sea levels, variability in storm surges and intensity, and the frequency and intensity of wildfires. These changes may affect the transportation infrastructure in various ways, such as damage to roadbeds from longer periods of intense heat; increasing storm damage from flooding and erosion; and inundation from rising sea levels. These effects will vary by location and may, in the most extreme cases, require that a facility be relocated or redesigned. There may also be economic and strategic ramifications as a result of these types of impacts to the transportation infrastructure.

[19] http://www.dot.ca.gov/hq/tpp/offices/orip/climate_change/projects_and_studies.shtml

At the federal level, the Climate Change Adaptation Task Force, co-chaired by the White House Council on Environmental Quality (CEQ), the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA), released its interagency task force progress report on October 28, 2011[20], outlining the federal government's progress in expanding and strengthening the Nation's capacity to better understand, prepare for, and respond to extreme events and other climate change impacts. The report provides an update on actions in key areas of federal adaptation, including: building resilience in local communities, safeguarding critical natural resources such as freshwater, and providing accessible climate information and tools to help decision-makers manage climate risks.

Climate change adaptation must also involve the natural environment as well. Efforts are underway on a statewide-level to develop strategies to cope with impacts to habitat and biodiversity through planning and conservation. The results of these efforts will help California agencies plan and implement mitigation strategies for programs and projects.

On November 14, 2008, then-Governor Arnold Schwarzenegger signed EO S-13-08, which directed a number of state agencies to address California's vulnerability to sea level rise caused by climate change. This EO set in motion several agencies and actions to address the concern of sea level rise.

In addition to addressing projected sea level rise, the California Natural Resources Agency (Resources Agency) was directed to coordinate with local, regional, state and federal public and private entities to develop The California Climate Adaptation Strategy (Dec 2009)[21], which summarizes the best-known science on climate change impacts to California, assesses California's vulnerability to the identified impacts, and then outlines solutions that can be implemented within and across state agencies to promote resiliency.

The strategy outline is in direct response to EO S-13-08 that specifically asked the Resources Agency to identify how state agencies can respond to rising temperatures, changing precipitation patterns, sea level rise, and extreme natural events. Numerous other state agencies were involved in the creation of the Adaptation Strategy document, including the California Environmental Protection Agency; Business, Transportation and Housing; Health and Human Services; and the Department of Agriculture. The document is broken down into strategies for different sectors that include: Public Health; Biodiversity and Habitat; Ocean and Coastal Resources; Water Management; Agriculture; Forestry; and Transportation and

[20] http://www.whitehouse.gov/administration/eop/ceq/initiatives/adaptation

[21] http://www.energy.ca.gov/2009publications/CNRA-1000-2009-027/CNRA-1000-2009-027-F.PDF

Energy Infrastructure. As data continues to be developed and collected, the state's adaptation strategy will be updated to reflect current findings.

The National Academy of Science was directed to prepare a Sea Level Rise Assessment Report[22] to recommend how California should plan for future sea level rise. The report was released in June 2012 and included:

- Relative sea level rise projections for California, Oregon and Washington taking into account coastal erosion rates, tidal impacts, El Niño and La Niña events, storm surge and land subsidence rates.
- The range of uncertainty in selected sea level rise projections.
- A synthesis of existing information on projected sea level rise impacts to state infrastructure (such as roads, public facilities and beaches), natural areas, and coastal and marine ecosystems.
- A discussion of future research needs regarding sea level rise.

In 2010, interim guidance was released by The Coastal Ocean Climate Action Team (CO-CAT) as well as Caltrans as a method to initiate action and discussion of potential risks to the states infrastructure due to projected sea level rise. Subsequently, CO-CAT updated the Sea Level Rise guidance to include information presented in the National Academies Study.

All state agencies that are planning to construct projects in areas vulnerable to future sea level rise are directed to consider a range of sea level rise scenarios for the years 2050 and 2100 to assess project vulnerability and, to the extent feasible, reduce expected risks and increase resiliency to sea level rise. Sea level rise estimates should also be used in conjunction with information on local uplift and subsidence, coastal erosion rates, predicted higher high water levels, storm surge and storm wave data.

The proposed project is not within the coastal zone and is not expected to experience direct impacts as a result of projected sea level rise.

Executive Order S-13-08 also directed the Business, Transportation, and Housing Agency to prepare a report to assess vulnerability of transportation systems to sea level rise affecting safety, maintenance and operational improvements of the system, and economy of the state. The Department continues to work on assessing the transportation system vulnerability to climate change, including the effect of sea level rise.

[22] *Sea Level Rise for the Coasts of California, Oregon, and Washington: Past, Present, and Future* (2012) is available at http://www.nap.edu/catalog.php?record_id=13389.

Currently, the Department is working to assess which transportation facilities are at greatest risk from climate change effects. However, without statewide planning scenarios for relative sea level rise and other climate change effects, the Department has not been able to determine what change, if any, may be made to its design standards for its transportation facilities. Once statewide planning scenarios become available, the Department will be able review its current design standards to determine what changes, if any, may be needed to protect the transportation system from sea level rise.

Climate change adaptation for transportation infrastructure involves long-term planning and risk management to address vulnerabilities in the transportation system from increased precipitation and flooding; the increased frequency and intensity of storms and wildfires; rising temperatures; and rising sea levels. The Department is an active participant in the efforts being conducted in response to EO S-13-08 and is mobilizing to be able to respond to the National Academy of Science Sea Level Rise Assessment Report.

Chapter 3 California Environmental Quality Act Evaluation

3.1 Determining Significance under the California Environmental Quality Act

The California Environmental Quality Act requires Caltrans to identify each "significant effect on the environment" resulting from the project and ways to mitigate each significant effect. If the project may have a significant effect on any environmental resource, then an environmental impact report must be prepared. Each and every significant effect on the environment must be disclosed in the environmental impact report and mitigated if feasible. In addition, the California Environmental Quality Act Guidelines list a number of mandatory findings of significance, which also require the preparation of an environmental impact report. This chapter discusses the effects of this project and California Environmental Quality Act significance.

Caltrans prepared and circulated an Initial Study with a Proposed Mitigated Negative Declaration for agency and public comment. Subsequently, Caltrans prepared this environmental impact report, which concludes there are no unavoidable significant impacts. There also are no significant irreversible environmental changes.

3.2 Discussion of Significant Impacts

The California Environmental Quality Act analysis relied on the technical studies to determine significance. Refer to Chapter 2 for detailed discussion of the impacts from the project.

3.2.1 Less than Significant Effects of the Project

- Land Use
- Farmlands
- Community Impacts
- Utilities and Emergency Services
- Traffic and Transportation
- Geology
- Hydrology and Floodplain

- Water Quality
- Paleontology
- Noise and Vibration
- Cultural Resources
- Air Quality

3.2.2 Significant Environmental Effects of the Project

The following impacts are less than significant with proposed mitigation. See Chapter 2 for further information.

- Visual Resources (Aesthetics)
- Biological Resources
- Hazardous Waste or Materials (Hazards and Hazardous Materials)

3.2.3 Unavoidable Significant Environmental Effects

There are no unavoidable significant environmental effects.

3.2.4 Significant Irreversible Environmental Changes

There are no unavoidable irreversible environmental changes.

3.3 Mitigation Measures for Significant Impacts under the California Environmental Quality Act

Avoidance, minimization and mitigation measures are detailed in each subsection in Chapter 2.

Chapter 4 Comments and Coordination

Early and continuing coordination with the general public and appropriate public agencies is an essential part of the environmental process to determine the scope of environmental documentation, the level of analysis, potential impacts and mitigation measures, and related environmental requirements. Agency consultation and public participation for this project have been accomplished through a variety of formal and informal methods, including project development team meetings, interagency coordination meetings, and correspondence exchange. This chapter summarizes the results of Caltrans' efforts to identify, address, and resolve project-related issues through early and continuing coordination.

Stakeholder Coordination Background

The Mojave Subdivision Tehachapi Rail Improvement project has been developed with guidance and support from a multi-jurisdictional team of federal, state, regional, local and private sector stakeholders. The main stakeholders of this environmental documentation process include the Caltrans Division of Rail and District 6 environmental staffs, the Union Pacific Railroad (UPRR), the BNSF Company (BNSF), Kern County, and the City of Tehachapi. The Caltrans Division of Rail serves in a contract management role, and District 6 serves as the lead agency for this project. Two railroad companies—UPRR and BNSF—are actively involved in this project as the facility owner and the project developer/applicant, respectively.

A former railroad infrastructure improvement project had been originally proposed by BNSF. The former project would have double-tracked five of the single-track segments in the Tehachapi Pass, which would have resulted in 8.34 miles of new track. These segment additions were to be placed from Bena to Marcel over the Tehachapi Mountains in Kern County. This proposal has recently been removed from consideration, and a new and reduced project has been proposed. This new project double-tracks only two of the single-track segments within the Tehachapi Pass, resulting in 1.38 miles of new track.

Notice of Cancellation

As stated earlier, the current project is similar to another project that would have double-tracked five segments of the Tehachapi Pass. The former project also included the same applicant and lead agency. To distinguish between the former five-segment project and the new two-segment project, a Notice of Cancellation was filed through the State Clearinghouse on March 25, 2013 (see Figure 4-1).

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY EDMUND G. BROWN Jr., Governor

DEPARTMENT OF TRANSPORTATION
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FRESNO, CA 93721-2716
PHONE (559) 445-6282
FAX (559) 445-6236
TTY (559) 488-4066

Flex your power!
Be energy efficient!

March 25, 2013

Notice of Cancelation of Draft Environmental Document
Tehachapi Rail Improvement Project SCH # 2010071076

You previously commented on the Draft Environmental Impact Report (DEIR) prepared for the Tehachapi Rail Improvement Projects or were on the project mailing list. The project circulated under SCH # 2010071076 has been discontinued by the applicant, BNSF Railway Co. The project and alternatives considered in that previous DEIR have been dropped from consideration and further analysis.

A new Notice of Preparation (enclosed) has recently been issued by Caltrans for a new project. The proposed project is a railroad infrastructure improvement and construction project located within an existing 25 mile railroad corridor in the Tehachapi Pass. The Project would construct an additional track for "double-tracking" along **two** of nine single-track segments that are located in the pass. The two segments, Walong to Marcel segment spanning a distance of 1.01 miles and the Cliff Siding Extension spanning a distance of .37 miles, double track a total distance of 1.38 miles. The project would also extend and improve or replace seven existing culverts as needed to accommodate the additional track.

The California Department of Transportation is the lead agency for the new two-segment project and will prepare an environmental impact report for the project. Attached is the recently circulated NOP. If you have any further questions, please contact Juan Torres, Associate Environmental Planner, at (559) 445-6479.

Sincerely,

Bryan Apper, Senior Environmental Planner
California Department of Transportation

Enclosure: Public Notice

"Caltrans improves mobility across California"

Figure 4-1 Notice of Cancellation

Also, copies of the Public Notice were sent to all applicable local agencies, elected officials, and those who commented on the former project, clarifying that the former project had been cancelled and would not receive further consideration.

Notice of Preparation

The project, which is a two-segment revision of the former project, required the preparation of a new Notice of Preparation of an Environmental Impact Report. This Notice of Preparation was circulated through the State Clearinghouse on March 15, 2013 (see Figure 4-2). A copy of the Public Notice was also sent by certified mail to applicable local agencies, elected officials, and other individuals, including those who commented on the former project, to solicit comments on the project now under consideration. See Chapter 6 for the list of recipients. The California Office of Planning and Research verified that the following agencies submitted comments through the State Clearinghouse on the Notice of Preparation.

- California Public Utilities Commission
- Native American Heritage Commission
- California Highway Patrol

The following agencies also submitted comment letters on the project:

- State of California Office of Planning and Research
- City of Tehachapi
- Kern County Department of Transportation
- Kern County Fire Department
- San Joaquin Valley Air Pollution Control District

SCH NO. 2013031048

NOTICE OF PREPARATION

To: (leave blank—will be filled in with Responsible/Trustee Agency)

From: California Dept. of Transportation
855 M Street, Suite 200
Fresno, CA 93721
ATTN: Juan Torres

Subject: **Notice of Preparation of a Draft Environmental Impact Report**
Reference: California Code of Regulations, Title 14, (CEQA Guidelines) Sections 15082(a), 15103, 15375.

Project Title: Tehachapi Rail Improvement Project
(Double Track between Marcel to Walong and the extension of Cliff Siding)

Project Location: Central Kern County; Greater Tehachapi Area

Project Description: The proposed project is a railroad infrastructure improvement and construction project located within an existing 25 mile railroad corridor in the Tehachapi Pass. The project would construct an additional track along two of nine single-track segments that are located in the Tehachapi Pass. The Walong to Marcel segment spans a distance of 1.01 miles, and the Cliff Siding Extension segment spans a distance of .37 miles, which will result in "double tracking" of a total distance of 1.38 miles. The project would also extend and improve existing culverts as needed to accommodate the additional track.

This is to inform you that the California Department of Transportation will be the lead agency and will prepare an environmental impact report for the project described below. Your participation as a responsible agency is requested in the preparation and review of this document.

We need to know the views of your agency as to the scope and content of the environmental information that is germane to your agency's statutory responsibilities in connection with the proposed project. Your agency will need to use the EIR prepared by our agency when considering your permit or other approval for the project.

The location map and the potential environmental effects are contained in the attached materials.

Due to the time limits mandated by State law, your response must be sent at the earliest possible date but not later than 30 days after receipt of this notice.

Please direct your response to Juan Torres Telephone (559) 445-6479 at the address shown above. Please supply us with the name for a contact person in your agency.

Date 3/14/2013 Signature

Title Associate Environmental Planner

Figure 4-2 Notice of Preparation

Consulting and Coordination with Public Agencies

Several different agencies and individuals provided input in response to the Notice of Preparation regarding the project. Table 4.1 summarizes concerns conveyed during the Notice of Preparation period.

Table 4.1 Summary of Concerns Received during Notice of Preparation Period

Topic	Concern	Reference in Document	Brief Description of how Concerns were Addressed.
General: Piecemeal Project	Change in the project from five segments to two segments was a piecemeal of a five-segment project, which would subvert the CEQA process and reduce the required mitigation	See the following heading: Summary found under Coordination with Public and Other Agencies	According to Section 21159.27 of the CEQA Guidelines, this is not an attempt by Caltrans or BNSF to divide the project into smaller projects with lesser environmental impacts.
General: Assessment of Impacts	The DEIR should demonstrate that significant impacts of the proposed project were adequately investigated and discussed and should not be restricted to areas next to areas receiving improvements	See Chapter 2	Where applicable, each sub-chapter of Chapter 2 now considers impacts of the project outside of the segments to be double-tracked.
General: Consistency with Local Plans	The DEIR should provide discussion on how the project is consistent with all appropriate local plans	See Section 2.1.1	The DEIR considered and discusses appropriate land use plans, including those from Kern County and the City of Tehachapi.
Construction: Private Crossings	Any modification to private crossings must conform to the California Public Utilities Commission standards	Not Applicable	Final engineering drawings and permit approvals would be contingent on meeting all applicable Commission standards. It is not considered as an environmental concern.
Cultural: Potential Resources	Potential resources may be near the project. To ensure that potential cultural resources are not affected, research and coordination with appropriate organizations should be conducted	See: Section 2.1.8, the 2013 Supplemental Historic Resource Compliance Report, and Chapter 6	Cultural resources in the project area were researched and evaluated to determine potential impacts. Coordination with applicable Native American tribes, as well as a search of Sacred Lands file was also done.
Traffic: Alternative Forms of Transportation	Traffic impacts should consider impacts to alternative forms of transportation in addition to vehicular traffic	See: Section 2.1.6 and the Traffic Impact Assessment technical report	Analysis of traffic impacts included discussion of applicable modes of transportation, as well as the effect of longer trains on adjacent intersections.

Table 4.1 Summary of Concerns Received during Notice of Preparation Period

Topic	Concern	Reference in Document	Brief Description of how Concerns were Addressed.
Public Services: Emergency Response	Discuss the impacts of longer trains and their associated longer gate-down times in regard to emergency services	See: Section 2.1.5, 2.1.6, and the Traffic Impact Assessment technical report	Gate-down time, as well as an alternative route analysis that modeled likely emergency service routes addressed the project's impacts for the City of Tehachapi.
Air Quality: Emissions Evaluation	Potential air quality impacts should be thoroughly identified, and evaluation should consider construction emissions, as well as operational emissions, which considers stationary and mobile sources. Emissions should be modeled through CaliEEmod. All modeling data should be included for reference.	See: Section 2.2.6 and the Air Quality Impact Analysis technical report	Air quality impacts were evaluated with the appropriate software for construction and operational impacts. Relevant discussion has been included. It should be noted that project operation does not feature any stationary sources. All data performed for the project has been included in an appendix in the technical report.

Chapter 5 List of Preparers

This environmental impact report was prepared by an interdisciplinary team of specialists from the Caltrans Division of Rail and Central Region, BNSF, and Union Pacific Railroad. Caltrans Central Region staff members are listed below. Table 5.1 lists the Division of Rail, BNSF, Union Pacific Railroad and consultant staff involved in the preparation of this document.

Sherry Alexander, Landscape Associate. Master's Degree in Landscape Architecture, California State Polytechnic University, Pomona; 6 years of Landscape Architecture experience and 17 years of planning experience. Contribution: Visual Impact Assessment Oversight.

Allam Alhabaly, Transportation Engineer. B.S., California State University, Fresno, School of Engineering; 12 years of experience in environmental technical studies with emphasis on noise studies, 3 years of experience in design and construction. Contribution: Oversight review of the Noise Study Report.

Bryan Apper, Senior Environmental Planner. M.A., Environmental Planning, California State University Consortium, Long Beach; B.A., English, California State University, Northridge; 30 years of environmental and transportation planning experience. Contribution: Environmental Unit Supervisor.

Jeanne Day Binning, Senior Environmental Planner. Ph.D., Anthropology, University of California, Riverside; B.A., Anthropology, California State University, Northridge; more than 40 years of cultural resources management experience, Great Basin and California. Contribution: Principal Investigator, Prehistoric Archaeology.

Christopher Brewer, Associate Environmental Planner (Architectural History). M.A., Public Administration, California State University, Bakersfield; 33 years of experience in California history, cultural resource management, and architectural history. Contribution: Historic Architecture Oversight.

Phong Duong, Associate Environmental Planner. B.S., Environmental/Health Science, California State University, Fresno; 5 years of transportation planning experience and 4 years of environmental planning experience. Contribution: Environmental Document Oversight.

Marie (Terry) Goewert, Associate Environmental Planner (Air Quality Specialist). B.S., Foods and Nutrition, Colorado State University; 13 years of environmental compliance experience and 7 years of environmental planning experience. Contribution: Air Quality Technical Study Oversight.

Kirsten Helton, Senior Environmental Planner. B.A., Economics, California State University, Fresno; 19 years of environmental planning experience. Contribution: Quality Assurance/Quality Control.

David Lanner, Associate Environmental Planner. B.F.A., Art, Utah State University; 14 years of cultural resources experience. Contribution: Cultural Resource Oversight.

Richard C. Stewart, Engineering Geologist, P.G. B.S., Geology, California State University, Fresno; 21 years of hazardous waste and water quality experience; 4 years of paleontology/geology experience. Contribution: Paleontology Oversight.

Juan Torres, Associate Environmental Planner. B.A., Environmental Studies, University of the Pacific; 12 years of environmental planning experience. Contribution: Environmental Document Oversight.

Philip Vallejo, Associate Environmental Planner. B.A., History, California State University, Fresno; 7 years of experience in architectural history field. Contribution: Historic Resource Compliance Report Oversight.

Juergen Vespermann, Senior Environmental Planner. Engineering Degree, Fachhochschule Muenster, Germany: 22 years of transportation planning/environmental planning. Contribution: Senior Hazardous Waste Oversight.

Charles Walbridge, Associate Environmental Planner. B.S., Biological Sciences, California State University, Fresno; 10 years of environmental planning experience. Contribution: Biology Oversight.

Table 5.1 List of Preparers

Roles	Responsibilities
Caltrans Division of Rail— Sacramento, CA	
Bruce Roberts	Project Manager, Division of Rail
Rick Deming	Chief, Environmental Branch, Division of Rail (now retired)
Royce Gotcher	Project Manager, Division of Rail
BNSF	
Aaron Hegeman	Director of Public Private Partnerships
Dava Kaitala	General Counsel
David Miller	Engineering Manager
David Seep	Director of Environmental Engineering and Program Development
Derin Warren	Manager of Environmental Permitting & Sustainability
Jennifer Guenther	Gresham Savage Nolan and Tilden- BNSF outside counsel
Juan Acosta	Director of Government Affairs
Marisa Blackshire	Senior General Counsel
Mark Ostoich	President, Gresham Savage Nolan and Tilden- BNSF outside counsel
Matt Graham	Manager of Environmental Remediation
Russell Light	Senior General Counsel
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Daryoush Razavian	Vice President, Olsson Associates, Hydraulic Engineering
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Dufey Exon	Manager Environmental Field Operations, Southern CA/Los Angeles Basin
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Ken Freimuth	Manager, Special Products Design
Patrick Prososki	UPRR Train Service, Engineering and Maintenance of Way
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Tom Dodson and Associates	
Lisa Tollstrup	Senior Biologist
Tom Dodson	Third Party Environmental Document Advisor/Reviewer

Table 5.1 List of Preparers (cont'd)

Roles	Responsibilities	Education
URS Corporation		
Benjamin Matlock	Environmental Planner	BS, City and Regional Planning
Brian Wynne	Principal-in-Charge	AA, Oceanographic Studies
Chandra Puramsetty	Hazards and Hazardous Materials Specialist	MS, Environmental Studies
Corinne Lytle Bonine	Visual Impact Specialist	BA, Environmental Studies
Craig Woodman	Cultural Resources	MA, Archaeology
Cynthia Gabaldon	Senior Engineer, Hydrology and Water Quality	BS, Civil Engineering;
Daniel Clark, AIA, NCARB	Architect	AA, Architecture; BS, Architecture
Dustin Kay	Archaeologist	BS, Anthropology
Greg Hoisington	Manager, Natural Resources - Permitting	MS, Biology; BS, Ecology and Environmental Biology
Hannah Young	Environmental Planner – Cumulative Impacts	MS, Regional Planning; BS, Biology
Jang Seo	Geographic Information System	BA, Geography
Jeff Crain	Botanist – Arborist	BS, Biological Sciences
Jeff Muller	Senior Geologist, Hazards and Hazardous Materials	MS, Marine Science ; BS, Environmental Science
Jeff Rice, AICP	Project Manager	MBA; BS, Urban and Regional Planning
Jeremy Hollins	Senior Architectural Historian	MA, Public History; BA, History
Joe Devoy	Geographic Information System	BS, Mechanical Engineering
Joe Stewart	Principal Paleontological Resources Specialist	PhD, Systematics and Ecology
Johnnie Garcia	GIS Technician	BA, Geography
Joseph Long	Manager, Water Resources	BS, Civil Engineering
Kasia Trojanowska, RLA	Landscape Architect	MS, Landscape Architecture; BS, Marketing and Business Administration
Kevin Cunningham	Project Coordinator, Transportation and Environmental Planner	BS, Urban and Regional Planning
Laurie Solis	Senior Archaeologist	MA, Archaeology
Lawrence Headley	Principal Visual Resources Specialist	MLA, Landscape Architecture; BS, Communications
Mark Storm	Senior Project Engineer/Noise Specialist	BS, Aeronautics & Astronautics
Mike Agbodo	Manager, Hydrology task lead	MS, Water Resources Engineering; BS, Civil Engineering
Noel Casil	Transportation and Traffic Engineer	BS, Civil Engineering
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Table 5.1 List of Preparers (cont'd)

Roles	Responsibilities	Education
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Raj Rangaraj	Senior Air Quality Scientist, QA/QC	MBA; Ph.D., Mechanical Engineering; MS, Civil Engineering
SM Alam	Transportation and Traffic Engineer	MS, Civil (Transportation) Engineering; BS Civil Engineering
Theodore Lindberg	Senior Acoustical Engineer	BA, Mathematics
Tin Cheung	Air Quality Specialist	BA, Environmental Studies and Geography.
Virginia Viado	Senior Urban Planner	BS, Urban and Regional Planning
William O'Braitis	Manager, Geo-Remediation	BS, Geology

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Appendix A California Environmental Quality Act Checklist

Marcel to Cliff Siding	**Mile Post 353.08 to 343.27**	**N/A**
Dist.-Co.-Rte.	P.M/P.M.	E.A.

This checklist identifies physical, biological, social and economic factors that might be affected by the proposed project. In many cases, background studies performed in connection with the projects indicate no impacts. A NO IMPACT answer in the last column reflects this determination. Where there is a need for clarifying discussion, the discussion is included either following the applicable section of the checklist or is within the body of the environmental document itself. The words "significant" and "significance" used throughout the following checklist are related to CEQA, not NEPA, impacts. The questions in this form are intended to encourage the thoughtful assessment of impacts and do not represent thresholds of significance.

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
I. AESTHETICS: Would the project:				
a) Have a substantial adverse effect on a scenic vista	☐	☐	☒	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☒	☐	☐
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	☒	☐

II. AGRICULTURE AND FOREST RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and the forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☒	☐
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code section 12220(g)), timberland (as defined by Public Resources Code section 4526), or timberland zoned Timberland Production (as defined by Government Code section 51104(g))?	☐	☐	☒	☐
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	☒
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	☐	☐	☐	☒
III. AIR QUALITY: Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☒	☐
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	☐	☐	☒	☐
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☒	☐
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IV. BIOLOGICAL RESOURCES: Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations or by the California Department of Fish and Game or US Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☒	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☒	☐	☐
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☒	☐	☐
V. CULTURAL RESOURCES: Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?	☐	☐	☒	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	☐	☒	☐
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	☒	☐
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VI. GEOLOGY AND SOILS: Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	☐	☐	☒	☐
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?	☐	☐	☒	☐
ii) Strong seismic ground shaking?	☐	☐	☒	☐
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☒	☐
iv) Landslides?	☐	☐	☒	☐
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☒	☐
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☒	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	☒
VII. GREENHOUSE GAS EMISSIONS: Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	An assessment of the greenhouse gas emissions and climate change is included in the body of environmental document. While Caltrans has included this good faith effort in order to provide the public and decision-makers as much information as possible about the project, it is Caltrans determination that in the absence of further regulatory or scientific information related to GHG emissions and CEQA significance, it is too speculative to make a significance determination regarding the project's direct and indirect impact with respect to climate change. Caltrans does remain firmly committed to implementing measures to help reduce the potential effects of the project. These measures are outlined in the body of the environmental document.			
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?				

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
VIII. HAZARDS AND HAZARDOUS MATERIALS: Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☒	☐	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☒	☐	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	☒
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	☒	☐
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
IX. HYDROLOGY AND WATER QUALITY: Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☐	☒	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☒	☐
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	☐	☐	☒	☐
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☒	☐
f) Otherwise substantially degrade water quality?	☐	☐	☒	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	☐	☐	☐	☒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami, or mudflow	☐	☐	☐	☒
X. LAND USE AND PLANNING: Would the project:				

a) Physically divide an established community?	☐	☐	☐	☒
b)Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☒	☐

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
XI. MINERAL RESOURCES: Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒
XII. NOISE: Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	☐	☒	☐
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☒	☐
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☒	☐
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

XIII. POPULATION AND HOUSING: Would the project:

	Potentially Significant Impact	Less Than Significant with Mitigation	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

XIV. PUBLIC SERVICES:

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	☐	☐	☒	☐
Fire protection?	☐	☐	☒	☐
Police protection?	☐	☐	☒	☐
Schools?	☐	☐	☐	☒
Parks?	☐	☐	☐	☒
Other public facilities?	☐	☐	☒	☐

XV. RECREATION:

a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	☐	☐	☒

XVI. TRANSPORTATION/TRAFFIC: Would the project:

a) Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	☐	☐	☒	☐
b) Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways?	☐	☐	☒	☐
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☒	☐
f) Conflict with adopted policies, plans or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?	☐	☐	☐	☒

XVII. UTILITIES AND SERVICE SYSTEMS: Would the project:

a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☒	☐

e) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☒	☐
g) Comply with federal, state, and local statutes and regulations related to solid waste?	☐	☐	☒	☐

XVIII. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	☐	☐	☒
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?	☐	☐	☒	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

Appendix B Title VI Policy Statement

STATE OF CALIFORNIA—BUSINESS, TRANSPORTATION AND HOUSING AGENCY EDMUND G. BROWN Jr., Governor

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Flex your power!
Be energy efficient!

March 16, 2012

NON-DISCRIMINATION
POLICY STATEMENT

The California Department of Transportation, under Title VI of the Civil Rights Act of 1964 and related statutes, ensures that no person in the State of California shall, on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity it administers.

For information or guidance on how to file a complaint based on the grounds of race, color, national origin, sex, disability, religion, sexual orientation, or age, please visit the following web page: http://www.dot.ca.gov/hq/bep/title_vi/t6_violated.htm.

Additionally, if you need this information in an alternate format, such as in Braille or in a language other than English, please contact Mario Solis, Manager, Title VI and Americans with Disabilities Act Program, California Department of Transportation, 1823 14th Street, MS-79, Sacramento, CA 95811. Phone: (916) 324-1353, TTY 711, fax (916) 324-1869, or via email: *mario_solis@dot.ca.gov.*

MALCOLM DOUGHERTY
Acting Director

"Caltrans improves mobility across California"

Appendix C Minimization and/or Mitigation Summary

Measures

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
Aesthetics	Oak tree mitigation would involve the planting of new oak trees off-site at a ratio of three to one for acres of impact. These restoration activities would be detailed in the Native Vegetation Restoration and Monitoring Plan. The Native Vegetation Restoration and Monitoring Plan would include grading plans to return temporarily-disturbed areas to pre-disturbance topography; native plant palettes including seed mixes and container-planting for each habitat type affected; a planting plan and schedule; a monitoring plan and schedule; a maintenance plan and schedule; and performance criteria for determining successful use of the plan. The restoration and monitoring plan would be used by BNSF/UPRR after construction activities have been completed. The final plan would be prepared and submitted prior to construction to the appropriate resource agency for approval.	Less Than Significant.	Prior to construction activities	BNSF contractor	Preparation of a Native Vegetation Restoration and Monitoring Plan for review and approval by the Kern County Planning and Community Development Department or other appropriate resource agency as necessary	Documentation obtained from Kern County and Caltrans staff verifying the restoration and monitoring plan was approved.
Air Quality	Fugitive Dust: Construction activities and operations of the tracks would comply with all applicable San Joaquin Valley Air Pollution Control District rules and regulations as follows: • Disturbed Areas: The construction contractor would effectively stabilize for fugitive dust control all disturbed areas that are not being actively used for construction purposes, using water or nontoxic chemical stabilizers/suppressants. • Storage Piles: The construction contractor would apply water or nontoxic chemical stabilizers/suppressants for fugitive dust control, or cover storage piles	Less Than Significant.	During construction	BNSF contractor and BNSF designated Environmental Site Monitor	Construction plans and specifications kept on-site by the BNSF contractor shall include applicable San Joaquin Valley Air Pollution Control District rules and regulations. Compliance through BNSF Contractor daily	Copies of approved construction drawings to be provided to County and Caltrans staff upon request.

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	with a tarp or other suitable cover or vegetative ground cover. Following the addition of materials to or the removal of materials from the surface of outdoor storage piles, said piles would be effectively stabilized for fugitive dust emissions, using sufficient water or nontoxic chemical stabilizer/suppressant. • Unpaved Roads: The construction contractor would effectively stabilize for fugitive dust control all onsite unpaved roads and offsite unpaved access roads using water or nontoxic chemical stabilizers/suppressants. • General Watering: The construction contractor would control fugitive dust emissions during land clearing, grubbing, scraping, excavation, land leveling, grading, cut-and-fill, and demolition activities by watering the construction site a minimum of two times daily when soil conditions are dry. • Dirt Hauls: When materials are transported offsite, the construction contractor would ensure that all material is covered or effectively wetted to limit visible dust emissions, and at least 24 inches of freeboard space from the top of containers must be maintained. • Dirt Carryout/Trackout: The construction contractor would install and maintain an approved carryout and trackout prevention procedure (e.g., grizzlies, gravel pads, paved interior roads) at the construction ingress/egress. The construction contractor would remove mud or dirt that has accumulated on adjacent				inspection.	

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	public streets at the end of each workday. In addition, carryout/trackout must be immediately removed when it extends 50 feet or more beyond the site exit. Carryout/trackout must be removed by manually sweeping, using a rotary brush broom accompanied or preceded by sufficient wetting, operating a PM_{10}-efficient street sweeper with a minimum pick-up efficiency of 80 percent, or flushing with water if curbs or gutters are not present, and where the use of water will not be a source of trackout material or result in adverse impacts on stormwater drainage systems. • Unpaved Road Speeds: The construction contractor would limit traffic speeds on unpaved roads to 15 miles per hour. • Erosion Control: The construction contractor would install gravel bags or other erosion-control measures to prevent silt runoff to public roadways from sites with a slope greater than 1 percent during ground-disturbing activities. • High Winds: The construction contractor would suspend excavation and grading activity when winds exceed 20 miles per hour. • Revegetation: The construction contractor would revegetate disturbed soil areas with native plants to minimize wind-blown dust.					
Air Quality	Construction Vehicle Exhaust: The construction contractor would properly service and maintain all construction equipment in accordance with the manufacturer's recommendations. BNSF has informed Caltrans and the San Joaquin	Less Than Significant.	During construction	BNSF contractor and BNSF designated Environmental Site Monitor	Reports prepared by BNSF contractor and/or BNSF designated	Verification documentation from Caltrans and San Joaquin Valley

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	Valley Air Pollution Control District that it intends to ensure that the project's construction vehicle fleet is consistent with the requirements of Rule 9510. BNSF does so without waiving any rights, including rights of preemption (federal rules exempting railroads from state and local regulations).				Environmental Site Monitor as needed or requested by Caltrans and San Joaquin Valley Air Pollution District. Compliance through BNSF Contractor daily inspection.	Air Pollution District as needed
Air Quality	Operational: These regional emissions result from locomotive exhaust from freight transport. Emissions from locomotives are currently minimized by the following agreements: • Statewide Rail Yard Agreement to Reduce PM at California Rail Yards (2005) • South Coast Memorandum of Mutual Understanding (1998) • Requirements for Intrastate Locomotive Fuel Use • United States Environmental Protection Agency emission standards	Less Than Significant.	During project operation	California Air Resources Board, San Joaquin Valley Air Pollution District and Federal EPA as needed	Reports prepared by California Air Resources Board, San Joaquin Valley Air Pollution District and Federal EPA as needed. BNSF to ensure project follows the agreements as described in freight transport plans	Verification documentation from California Air Resources Board, San Joaquin Valley Air Pollution District and Federal EPA as needed

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
Biological Resources	Impacts to 57 oak trees protected under Senate Concurrent Resolution No. 17 would be replaced on-site as part of the Native Vegetation Restoration and Monitoring Plan, or at an approved off-site mitigation area. This replacement is in conformance with local regulations, including the Kern County Oak Tree Conservation Ordinance. Off-site mitigation would be at a 3:1 ratio for acres of impacts within areas occupied by the 57 oak trees.	Less Than Significant.	During grading and construction activities	BNSF contractor	Preparation of a Native Vegetation Restoration and Monitoring Plan for review and approval by the Kern County Planning and Community Development Department or other appropriate resource agency as necessary	Documentation or review and approval from the Kern County Resource Management Agency to be provided by BNSF on request that oak tree replacement and restoration was successfully completed.
Biological Resources	Prior to ground-disturbing activities during the nesting season (February 15-September 15), a qualified biologist will conduct and submit a preconstruction migratory nesting bird and other raptors survey report. The survey shall occur prior to initiation of project activities, and any occupied passerine and/or raptor nest occurring within or adjacent to the project footprint will be delineated in the field with an appropriate buffer (typically 200 feet, or 500 feet for raptors). To the maximum extent practicable, a minimum buffer zone from occupied nests will be maintained during physical ground-disturbing activities. Once nesting has ended, the buffer may be removed.	Less Than Significant.	Prior to construction activities	BNSF contractor and BNSF designated Environmental Site Monitor, and a qualified Biologist	Documentation in a preconstruction nesting bird survey report if referenced disturbance activities occur during the identified avian nesting season	Documentation or review and approval from Kern County Resource Management Agency to be provided by BNSF on request
Biological Resources	BNSF/UPRR will develop and implement a Native Vegetation Restoration and Monitoring Plan for temporarily-disturbed areas within the BSA (e.g., staging areas and access roads). The Native Vegetation Restoration and Monitoring Plan will include: grading plans to return temporarily-disturbed areas to pre-disturbance topography; native plant palettes including seed mixes and container planting for each habitat type impacted; a planting plan and	Less Than Significant.	Prior to construction activities	BNSF contractor and BNSF designated Environmental Site Monitor	Preparation of a Native Vegetation Restoration and Monitoring Plan for review and approval by the Kern County Planning and Community	Documentation or review and approval from Kern County Resource Management Agency to be provided by BNSF on request

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	schedule; a monitoring plan and schedule; a maintenance plan and schedule; and performance criteria for determining successful implementation of the plan. The restoration and monitoring plan will be implemented by BNSF/UPRR after construction activities have been completed. The final plan will be prepared and submitted prior to construction to the appropriate resource agency for approval.				Development Department or other appropriate resource agency as necessary	
Biological Resources	To avoid attracting predators and nuisance species, the biological study area would be clear of debris, where possible. All food-related trash items must be enclosed in sealed containers and regularly removed.	Less Than Significant.	During construction activities	BNSF contractor and BNSF designated environmental site monitor.	Compliance through BNSF contractor daily inspection.	BNSF contractor report to be available on request.
Biological Resources	BNSF/UPRR would develop and use a worker environmental education program for employees and contractors working in the biological study area. The program would include descriptions an explanation of the sensitive biological resources associated with the project, explanation of the avoidance and mitigation measures designed to reduce impacts to these resources, description and locations of environmentally sensitive areas, and definition of the role of workers on-site to prevent impacts to sensitive biological resources.	Less Than Significant.	Prior to construction activities	BNSF contractor and BNSF designated environmental site monitor.	Preparation of a worker environmental education program for review and approval by the Kern County Planning and Community Development Department or other appropriate resource agency as necessary.	Documentation obtained from Kern County and Caltrans staff verifying the worker environmental education program was approved.
Biological Resources	Measures to prevent the spread or reintroduction of invasive plant species during construction operations would be used under the direct supervision of the Caltrans district biologist. The re-vegetation of upland areas would incorporate the appropriate native plant species found within the Tehachapi Mountains and be approved in concept by the appropriate resource agency.	Less Than Significant.	During construction activities	BNSF contractor and BNSF designated environmental site monitor and Caltrans district biologist	Compliance through BNSF contractor daily inspection and inspections from the Caltrans district biologist.	BNSF contractor report to be available on request.

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
Biological Resources	Prior to construction, BNSF/UPRR will stake, flag, fence, or otherwise conspicuously demarcate in the field all environmentally-sensitive areas that are to be protected in place and remain undisturbed during construction. Environmentally sensitive areas include riparian habitat, oak woodlands, aquatic habitat, and any raptor or nesting bird locations identified prior to ground-disturbing activities.	Less Than Significant.	Prior to construction activities.	BNSF contractor and BNSF designated Environmental Site Monitor	BNSF shall identify native species trees on project grading plans and review with Kern County Resource Management Agency prior to approval.	Documentation or review and approval from Kern County Resource Management Agency to be provided by BNSF on request.
Biological Resources	The project may include a moderate risk that noxious weeds would be introduced and/or spread during construction. As a result, the following best management practices would be used: • Prior to construction, populations of plants listed as invasive exotics by the California Invasive Plant Council (CalIPC) in the most recent CalIPC High or Alert list, would be identified on the ground and on maps through a preconstruction survey. This would establish a baseline from which to locate equipment washdown stations as well as to evaluate post-construction monitoring surveys. • All construction equipment must be washed to prevent the spread of invasive weeds from other areas. Clearing and grading equipment must be washed down with high-pressure water. • Construction personnel would be educated on the importance of controlling and preventing the spread of invasive non-native species infestations. Gravel and/or fill material to be placed in relatively weed-free areas would come from weed-free sources.	Less Than Significant.	During construction activities	BNSF contractor and BNSF designated environmental site monitor	Preparation of a worker environmental education program for review and approval by the Kern County Planning and Community Development Department or other appropriate resource agency as necessary	Documentation obtained from Kern County and Caltrans staff verifying the worker environmental education program was approved. BNSF contractor report to be available on request.

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	• Where practicable and as needed, weed abatement efforts would be targeted to avoid populations of plants listed as invasive exotics in the most recent CalIPC High or Alert list.					
Biological Resources	Before beginning grading activities, BNSF/UPRR would consult with the Regional Water Quality Control Board, U.S. Army Corps of Engineers, and the California Department of Fish and Game to verify the extent of impacts that project construction would have on aquatic resources. BNSF/UPRR would obtain all necessary permits required by the identified agencies before construction.	Less Than Significant.	Prior to construction activities.	BNSF designated contractor	Obtained all permits	Proof of permits upon request
Biological Resources	Before undertaking ground-disturbing activities within the biological study area that may adversely impact oak woodlands,[23] large individual oaks,[24] or any other trees species that are equal to or greater than 30 centimeters diameter at breast height (dbh) or impacting 15 meter-wide riparian vegetation corridors along streams and drainages, BNSF/-UPRR would coordinate with Kern County to ensure that the project is consistent with any applicable local tree, shrub, plant, and drainage protection requirements.	Less Than Significant.	Prior to construction activities.	BNSF contractor and designated Environmental Site Manager	BNSF shall identify native species trees on project grading plans and review with Kern County Resource Management Agency prior to approval	Documentation or review and approval from Kern County Resource Management Agency to be provided by BNSF on request
Community Impacts	The Uniform Relocation Assistance and Real Property Acquisitions Policies Act (Uniform Act) of 1970 (Public Law 91-646, 84 Stat. 1894) mandates that payments be made available to eligible residents, businesses, and nonprofit organizations displaced or affected by projects. The Uniform Act provides for equitable land acquisition policies. Where acquisition is unavoidable, the provisions of the Uniform Act	Less Than Significant	Prior to construction activities	BNSF contractor	A formal offer from UPRR and BNSF, which reflects market value, is provided to property owners affected by property	Copies of authorized contracts or other agreements relating to property acquisition for private railroad

[23] *Oak woodlands are characterized by canopy cover by oak trees of at least ten percent (10%), as determined from base line aerial photography or by site survey.*

[24] *Oaks greater than 15 centimeters diameter at breast height.*

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	and the 1987 Amendments as implemented by the Uniform Relocation Assistance and Real Property Acquisition Regulations for federal and federally assisted programs adopted by the Department of Transportation on March 2, 1989 would be followed. An independent appraisal of the affected property would be obtained, and an offer for the full appraisal would be made.				acquisitions	right-of-way must be available on request
Cultural Resources	Caltrans and BNSF must ensure that impacts to cultural resources related to the unanticipated discovery of human remains are reduced to less than significant levels by ensuring that, in the event that human remains are encountered, construction in the area of the find must cease, and the remains stay in situ pending definition of an appropriate plan. State Health and Safety Code Section 7050.5 states that further disturbances and activities must cease in any area or nearby area suspected to overlie remains. The Kern County Coroner must be contacted. Pursuant to Public Resources Code Section 5097.98, in the event the remains are Native American in origin, the Native American Heritage Commission would be contacted to determine necessary procedures for protection and preservation of the remains, including identifying the Most Likely Descendent or reburial, as provided in the CEQA Guidelines, Section 15064.5(e), "CEQA and Archaeological Resources," CEQA Technical Advisory Series.	Less Than Significant.	In the event that human remains are discovered during grading and construction activities	BNSF contractor, BNSF designated environmental site monitor, Kern County Coroner, and California Native American Heritage Commission (if remains are Native American in origin)	Inspection and analysis by Kern County Coroner and/or Native American Heritage Commission	Verification that clearance documentation from the Kern County Coroner and/or Native American Heritage Commission has been received by Kern County and Caltrans staff
Geology	The applicant would use measures to minimize erosion from a construction and operations standpoint. These measures would include preparation of a Storm Water Pollution Prevention Plan, dust control plan, and re-vegetation plan that would address the following: • Soil stabilization practices • Control practices to reduce wind	Less Than Significant.	Prior to grading and construction	BNSF contractor and BNSF designated environmental site monitor	BNSF contractor must implement, as needed, any necessary measures identified in the SWPPP, dust control plan and re-vegetation	Submittal of approved SWPPP, dust control plan, and re-vegetation plan provided to and verified by Kern County and

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	erosion of soil stock piles and construction areas • Standard construction and operation practices to minimize dust • Stabilization of soil in areas of disturbance by establishing appropriate vegetation				plans to minimize soil erosion	Caltrans staff
Geology	During seismic events, train operators and maintenance staff must conduct the following steps to ensure continued safe operation of the train: • Stop rail traffic if ground shaking is experienced • Careful examination of the tracks and adjacent areas throughout the project area with a focus on identified fault crossings • Repair of any areas of deflected or distressed track and restore/re-level any areas of differential settlement or disturbed ballast	Less Than Significant.	During moderate (5.0) or greater magnitude seismic events	BNSF operations staff	Appropriate safety reports prepared by BNSF operations staff	Submittal of safety reports to and verified by Kern County and Caltrans staff upon request
Geology	To reduce the potential disruption to train operations from landslides, the project proponent would implement the following minimization measures: • During final project design and before project grading, BNSF would improve stability of cut slopes identified by the project geotechnical engineers with structural elements like tiebacks or soil nails. • If a landslide should affect the rail corridor, BNSF would stabilize landslides by remedial grading or other methods, if economically feasible. • Slope inclinations would be reduced to minimize slope instability.	Less Than Significant.	Construction related: final project design and before grading. Operations related: during a landslide event	Construction related: BNSF contractor and BNSF designated environmental site monitor. Operations related: BNSF operations staff	Construction related: identification of slope stability elements on project plans. Operations related: appropriate safety reports prepared by BNSF operations staff.	Construction related: copies of approved construction drawings to be provided upon request. Operations related: submittal of safety reports to and verified by Kern County and Caltrans staff upon request.

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
Hazards and Hazardous Waste	A Preliminary Site Investigation must be done to identify potentially contaminated materials within the project segments prior to construction. During project construction, the railroads must retain the service of an on-call, qualified professional industrial hygiene firm to support the environmental site monitor to monitor grading activities. If any hazardous materials or contamination are found during excavation, all work shall be halted in the affected area until a qualified hazmat consultant, such as a Registered Environmental Assessor or a Registered Geologist, makes a determination as to the scope and extent of the contamination. If contamination is limited, remediation of the site shall be conducted by a licensed contractor in accordance with state and local guidelines. If the scope of the contamination is considered extensive, the developer shall contact the state DTSC to determine the appropriate form of remediation, which may include the developer entering into a Voluntary Work Plan (VWP). The hazmat consultant shall file a final report to the Caltrans upon completion of remediation activities.	Less Than Significant.	Prior and during grading and construction	BNSF contractor, BNSF designated Environmental Site Monitor, and a qualified geologist	Determination made by a Registered Environmental Assessor or a Registered Geologist as to the scope and extent of any contamination identified during grading and excavation activities.	Verification that clearance documentation from Registered Environmental Assessor or a Registered Geologist has been received by County and Caltrans staff
Hazards and Hazardous Waste	All construction- and maintenance-related activities occurring at the project will complete the following: • Construction personnel shall ensure that waste, including trash and litter, garbage, other solid waste, petroleum products, and other potential hazardous materials, would be properly handled by the railroads' construction personnel in accordance with state and federal regulations and permit requirements and removed from the site to a permitted disposal facility. All trash containers would have sealed and secured lids. • The railroad construction personnel	Less Than Significant.	Prior and during grading and construction	BNSF contractor and BNSF designated Environmental Site Monitor	Submittal of a Fire Suppression Management Plan and Emergency Response Plan to be approved by County Fire Department	Verification that clearance documentation from the County Fire Department has been received by County and Caltrans staff

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	shall be responsible to ensure all major equipment maintenance and vehicle fueling within the construction area would occur within a lined containment area to prevent release to the surrounding environment. • A Fire Suppression Management Plan shall be prepared by the railroad's contractor(s) and approved by County Fire Department before beginning earth-moving activities. The plan would outline the procedures to be followed to prevent accidental fire from construction activities. The plan would contain a chain of command, contact information (including fire departments), and location and placement of fire suppression equipment such as water trucks and fire extinguishers. Monitoring contractor compliance with the Fire Suppression Management Plan would be the responsibility of the Environmental Site Monitor present on site during grading activities and retained by the project proponent before construction. • The railroads shall prepare a Construction Emergency Response Plan to be approved by County Fire Department before beginning work and implemented by the railroads' contractor(s) during construction activities					
Hazards and Hazardous Waste	Blasting activity would likely occur in the two segments of the project. To remediate impacts from the blasting activity, the railroads shall implement the following minimization measures: • Before beginning construction activities, the railroads shall retain the services of a blasting contractor	Less Than Significant.	Prior and during grading and construction	BNSF contractor and BNSF designated Environmental Site Monitor	Documents provided by blasting contractor identifying appropriate license to use	Verification that clearance documentation from the County Fire Department has been received by

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	licensed to use Class A explosives, and licensed as a contractor in the State of California, to conduct any blasting required for project construction. The contractor shall be required to comply with all applicable regulations and standards established by the regulatory agencies, codes, and professional societies including the rules and regulations for storage, transportation, delivery, and use of explosives. Compliance with California Code of Regulations, Title 8 (Division of Occupational Safety and Health - Cal/OSHA). In addition to these basic requirements, a blasting plan may be required by Caltrans or the County of Kern Building Department to address specific mitigation measures on a site-impact-specific basis. A blasting plan is intended to help ensure worker safety and the protection of natural, historic and cultural resources. Other requirements or restrictions may apply based on regulatory review. Elements of a blasting plan shall include the following: • Description of the procedures to be implemented to protect workers during blasting. • Description of the procedures for proper storage and transportation of explosive materials. • Prohibition of blasting during extreme fire danger periods. • Description of the procedures to prevent impact to biological resources. • Detailed procedures to ensure that flyrock, air blast, and ground vibration are controlled. • Procedures to protect existing facilities and utility lines.				Class A explosives and submittal and approval of a blasting plan if necessary.	County and Caltrans staff

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	• Procedures for notifications to local residents and businesses near blast areas					
Hazards and Hazardous Waste	BNSF would continue to maintain current operating rules and procedures during project construction and operation as well as the current System Hazardous Materials Emergency Response Plan to reduce the risk of an accident and to minimize the potential risk of exposure to hazardous materials. The railroads would also continue to use their current procedures for weed abatement during construction and operation to ensure that all waterways and bridges are buffered to comply with laws for pesticide application and manufacturer's label requirements, and that herbicide would not be applied directly to water or to areas where surface water is present.	Less Than Significant.	During operation	BNSF	Appropriate documentation kept on file with BNSF.	Submittal of requested documentation provided to and verified by County and Caltrans staff
Hydrology	During construction, work within or over the floodways shall be scheduled by the project proponent during the non-rainy season. Minor impacts to sediment buildup would occur during construction of the project. Mitigation would involve energy dissipation measures and best management practices to minimize sedimentation buildup and erosion.	Less Than Significant.	During construction in the months of October through March within and over floodways	BNSF contractor and BNSF designated Environmental Site Monitor	BNSF contractor shall implement any necessary BMPs, such as sand bags or other such measures, to minimize sediment buildup and erosion	Submittal of appropriate documentation provided to and verified by County and Caltrans staff
Noise	To minimize construction noise and maintain conformance to applicable worker safety requirements, BNSF shall implement the following measures into the project contract specifications before beginning construction activities: • All noise-producing project equipment and vehicles using internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition	Less Than Significant.	During construction	BNSF contractor and BNSF designated Environmental Site Monitor	BNSF contractor shall utilize mufflers, shields and other similar devices on all noise producing equipment used during construction. In addition, construction staff will be required to follow	Copies of compliance reports or other documentation shall be provided to County and Caltrans staff upon request.

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	that meet or exceed original factory specification. Mobile or fixed "package" equipment shall be equipped with shrouds and noise control features that are readily available for that type of equipment. • All mobile or fixed noise-producing equipment used on the project, which is regulated for noise output by a local, state, or federal agency, shall comply with such regulation while in the course of project activity. • Electrically-powered equipment instead of pneumatic or internal combustion powered equipment shall be used, where feasible. • Material stockpiles and mobile equipment staging, parking, and maintenance areas shall be located as far as practicable from noise-sensitive receptors. • Construction site and access road speed limits shall be established and enforced during the construction period. • Construction operations shall be limited to the hours between 6:00 a.m. and 9:00 p.m. Monday through Friday, and limited to the hours between 8:00 a.m. and 9:00 p.m. on weekends. Construction contract provisions shall limit hours of construction including noisy maintenance activities and all spoils and material transport to these periods and days. • The use of noise-producing signals, including horns, whistles, alarms, and bells shall be for safety warning purposes only. • The on-site construction supervisor				applicable safety rules and regulations to minimize construction related noise.	

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	shall have the responsibility and authority to receive and resolve noise complaints. A clear appeal process to the Owner shall be established prior to construction commencement that will allow for resolution of noise problems that cannot be immediately solved by the site supervisor. • All project workers exposed to noise levels above 80 dBA shall be provided with personal protective equipment for hearing protection (i.e. earplugs and/or earmuffs); areas where noise levels are routinely expected to exceed 85 dBA shall be clearly posted with signs stating "Hearing Protection Required in this Area."					
Traffic	A Traffic Management Plan would be prepared prior to the start of construction by BNSF to reduce and minimize impacts to private grade crossings and roads leading to the crossings within the affected environment. This plan should also include the following: • A minimum of one open lane for traffic at two-lane roadways would be maintained if there are no options for detours at roadway crossing work zones. • BNSF and its contractor shall provide flagmen to direct traffic at construction areas next to public roadways to mitigate conflicts between construction activities and vehicular traffic, if warranted. • BNSF and its contractor shall coordinate with the County of Kern Roads Department to provide advance warning signs in construction zones to alleviate conflicts between construction activities and vehicular traffic.	Less Than Significant.	Prior to and during grading and construction	BNSF contractor and BNSF designated Environmental Site Monitor	BNSF contractor shall have, on-site, a copy of the Traffic Management Plan approved by the County of Kern Public Works Department	Submittal of approved Traffic Management Plan provided to and verified by County and Caltrans staff

Impact Category	Measure	Impact After Measure	Implementation Timing	Designated Monitor	Method of Verification	Compliance Verification
	• BNSF and its contractor shall coordinate with Caltrans and/or the County of Kern Public Works Department to implement a public awareness campaign advising motorists and local residents on the dates of construction and details of potential road closures.					
Water Quality	Grading and construction plans submitted by the applicant must meet the requirements of the State Water Resources Control Board National Pollutant Discharge Elimination System Statewide General Permit for Storm Water Discharges Associated with Construction Activity Permit (Final Order No. 2012-011-DWQ, NPDES No. CAS000003). Review and approval of grading and construction plans must be the responsibility of Caltrans and the Kern County Public Works and Building Department.	Less Than Significant	Prior to Construction	BNSF Design Division	Approval of the plans by Caltrans and the Kern County Public Works and Building Department	Copy of the National Pollutant Discharge Elimination System General Permit to be available on-site
Water Quality	BNSF would submit for review and approval to Caltrans and the Kern County Public Works Department a construction Stormwater Pollution Prevention Plan for the entire project. The Stormwater Pollution Prevention Plan would be used throughout the duration of the project (currently Water Quality Order 99-08-WQ; as of July 2010: Order No. 2009-0009-DWQ as amended by 2010-0014-DWG), adopted on November 16, 2010, and became effective on February 14, 2011).	Less Than Significant	Prior to Construction	BNSF Design Division	Approval of the plans by Caltrans and Kern County Public Works and Building Department	Copy of the National Pollutant Discharge Elimination System General Permit to be available on-site

Appendix D List of Technical Studies

The following technical studies have been prepared for the project and are provided separately in the BNSF/UPRR Mojave Subdivision Tehachapi Rail Improvement Program Combined Technical Studies document associated with this Environmental Impact Report:

- Aesthetics/Visual Resources Impact Assessment
- Air Quality Impact Analysis
- Noise and Vibration Technical Report
- Hydrology, Hydraulics, and Water Quality Technical Report
- Limited Hazardous Materials Investigation
- Limited Geology and Soils Investigation
- Historical Resources Compliance Report
- Archaeological Survey Report
- Historic Resource Evaluation Report
- Paleontological Identification Evaluation Report
- Natural Environment Study-Minimal Impacts
- Jurisdictional Delineation Report
- Transportation Impact Assessment