



3.11 WATER RESOURCES

This section describes the existing setting for water resources and water quality within the proposed project study area. This section also analyzes the potential impacts on hydrology, surface water quality, groundwater, flooding, and storm water runoff and assesses their impact in relation to the operation of the railroad, construction activities associated with Bakers Creek, Foss Creek, Black Point Bridge, and the Lombard Siding, and maintenance and repair activities associated with operations of the railroad. Effects on wetland resources are addressed in Section 3.2, Biological Resources. The water resources study area occurs in the immediate vicinity of the NCRA railroad right-of-way in Napa, Marin, Sonoma, and Mendocino counties.

3.11.1 Regulatory Setting

The regulatory setting is based on the information that was available in 2008, when the March 9, 2009 DEIR was first prepared.

The U.S. EPA is the primary federal agency, governed by the CWA, responsible for water quality management, and the SWRCB is the primary state agency responsible for water quality management. In California, EPA Region IX has delegated authority for waste discharge permitting to the SWRCB, which regulates through their network of Regional Water Quality Control Boards.

3.11.1.1 *Federal Regulations*

Clean Water Act

The purpose of the CWA is to protect and maintain the quality and integrity of the nation's waters by requiring states to develop and implement state water plans and policies. The CWA establishes the framework for regulating discharges of pollutants into the waters of the United States and authorizes EPA to implement pollution control programs. The CWA includes requirements for setting water quality standards of all contaminants in surface waters, and makes it unlawful for any person to discharge a pollutant from a point source into navigable waters, unless a permit is obtained under the provision. Point sources of pollution are those that can be easily identified such as a discharge pipe or channel that originates from industrial or wastewater treatment plants. The CWA also regulates nonpoint discharges such as stormwater runoff.



Section 303(d) of the CWA requires states, territories and authorized tribes to develop a list of water quality limited segments. These waters on the list do not meet water quality standards, even when the minimum required levels of pollution control technology have been installed at point sources of pollution. The CWA requires jurisdictions to establish priority rankings for water on these lists and develop action plans, called Total Maximum Daily Loads, to improve water quality.

National Pollution Discharge Elimination System (NPDES). The NPDES program regulates both point and nonpoint discharges. Since the proposed project will not involve stationary point source discharges, this section will focus on nonpoint discharges only.

The NPDES Nonpoint Source (NPS) program regulates runoff water quality with the objective of controlling and reducing pollutant input to water bodies from nonpoint discharges. NPS pollution, unlike point source pollution from industrial and sewage treatment plants, comes from many different sources. NPS pollution is caused by rainfall or snowmelt moving over and through the ground. Water runoff can pick up and transport pollutants, both natural and human-made, ultimately depositing them into surface water bodies, wetlands, coastal waters, and underground water supplies. This permitting program is administered by the Regional Water Quality Control Boards (RWQCBs), as determined by the EPA and the SWRCB. An NPDES stormwater permit is needed for any construction activity that will disturb, or is part of a "common plan" of development that will disturb, one or more acres, and has the potential to have a discharge of stormwater into a waterbody of the U.S.

Section 401. Section 401 of the CWA applies to any work that is to be completed in and around the various surface water bodies. Basically, Section 401 requires any applicant for a federal permit involving activities that may result in a discharge of pollutants to the water of the U.S. to first obtain a Water Quality Certification (WQC) from the State.

Section 404. Section 404 of the CWA establishes programs for regulating the discharge of dredged and fill material into waters of the U.S., including wetlands (wetlands are addressed in Section 3.2, Biological Resources, of this DEIR). As part of the application process for a Section 404 permit, the applicant must demonstrate the following:



- Steps have been taken to avoid wetland impacts where practicable;
- Potential impacts on wetlands are minimized; and
- Compensation is provided for any remaining unavoidable impacts through activities that will restore or create wetlands.

Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act may be applicable if the affected waterbody is designated "Navigable". Section 10 requires authorization from the USACE for the construction of any structure in or over navigable waters of the U.S., the excavation/dredging or deposition of material in these waters, or any obstruction or alteration in "navigable water". "Navigable water" in the U.S. is one subject to the ebb and flow of the tide shoreward to the mean high water mark and/or presently used, or has been used in the past, or is susceptible for use to transport interstate or foreign commerce.

Coastal Zone Management Act

The Coastal Zone Management Act of 1972 (CZMA) was enacted to protect the coastal environment from increasing demands related to residential, commercial, recreational, and industrial uses. The provisions of the CZMA assist coastal states in the development of coastal management programs. A San Francisco Bay Plan has been prepared by the San Francisco Bay Conservation and Development Commission and is an approved coastal plan under the CZMA. Any permitted activity in San Francisco Bay must be determined to be consistent with the Bay Plan.

Executive Order 11988/Federal Emergency Management Agency – Flood Control

Executive Order 11988 requires federal agencies to avoid, to the extent possible, the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative. FEMA requires that local governments are covered by federal flood insurance, and that they enforce a floodplain management ordinance that specifies minimum requirements for any construction within the 100-year floodplain. Under Executive Order 11988, FEMA Region IX is responsible for management of floodplain areas in California.



FEMA is tasked with responding to, planning for, recovering from and mitigating against disasters, which includes the National Flood Insurance Program (NFIP). The NFIP identifies and maps the Nation's floodplains and provides an alternative to disaster assistance to reduce the escalating costs of repairs caused by floods (FEMA, 2004). A "floodplain" is a lowland adjacent to a river, lake or ocean. Floodplains are designated by the frequency of the flood that is large enough to cover them. For example, the 10-year floodplain will be covered by the 10-year flood and the 100-year floodplain by the 100-year flood.

NFIP includes flood insurance, mitigation activities and floodplain management. Floodplain management is the operation of a community program of corrective and preventative measures for reducing flood damage. These measures take a variety of forms and generally include zoning, subdivision, or building requirements, and special-purpose floodplain ordinances (FEMA, 2004) and Executive Orders.

FEMA has conducted flood analysis studies throughout California, and these studies have resulted in the development of Flood Insurance Rate Map's (FIRMs). These FIRMs identify the estimated limits of the 100-year and 500-year flood events in various watersheds. The flood designations include:

- Zone A - Areas of 100-year flood, base flood elevations and flood hazard factors not determined;
- Zone AO - Areas of 100-year shallow flooding where depths are between one and three feet; average depths of inundation are shown, but no base hazard factors are determined;
- Zone AH - Areas of 100-year shallow flooding where depths are between one and three feet; base flood elevations are shown, but no base hazard factors are determined;
- Zones A1-A30 - Areas of 100-year flood, base flood elevations and flood hazard factors determined;
- Zone B - Areas between limits of the 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one foot or where the contributing drainage area is less than one square mile; or areas protected by levees from the base flood;



- Zone C - Areas of minimal flooding;
- Zone D - Areas of undetermined, but possible, flood hazards; and
- Zone X - Areas determined to be outside the 500-year floodplain.

FEMA has designated flood hazard areas within project areas in terms of Flood Hazard Boundary Maps and/or FIRMs (see Figure 3.11-1).

3.11.1.2 State Regulations

Porter-Cologne Water Quality Control Act - State Water Resources Control Board

The SWRCB and the nine RWQCBs throughout California regulate water quality in surface and groundwater bodies. Water quality is regulated through the Porter-Cologne Water Quality Act of 1969 (Division 7 of the California Water Code) (Porter-Cologne Act). The intent of the Porter-Cologne Act is to regulate factors which may affect the quality of Waters of the State to attain the highest quality which is reasonable, considering a full range of demands and values. The Porter-Cologne Act contains a complete framework for the regulation of waste discharges to both surface waters and groundwaters of the state, through the issuance of Waste Discharge Requirements (WDRs) by the RWQCBs.

The proposed project falls under the jurisdiction of the North Coast RWQCB and the San Francisco Bay RWQCB, which are responsible for the implementation of state and federal water quality protection statutes, regulations and guidelines.

Lake or Streambed Alteration Agreement Program (California Fish and Game Code Sections 1601-1607)

The proposed project includes work to be completed along the banks of various surface water bodies (identified in Section 3.2.2, Biological Resources – Environmental Setting), thus an application for a Lake or Streambed Alteration Agreement would be required, and a permit obtained from the CDFG. Section 1602 of the California Fish and Game Code requires any person who proposes a project that will substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank or any river, stream, or lake or use materials from a streambed, to notify the CDFG before initiating construction and repair activities.



McAteer Petris Act - Bay Conservation and Development Commission

The San Francisco BCDC is authorized under the McAteer-Petris Act to implement the San Francisco Bay Plan. This agency is also responsible for administering the federal CZMA within the San Francisco Bay portion of the California Coastal Zone. A permit may be required from BCDC in the event that construction is necessary within 100 feet of the mean high tide mark. The BCDC's jurisdiction includes the open water marshes and mudflats of the greater San Francisco Bay and portions of most creeks (including all creeks that are subject to tidal action), rivers and sloughs and other tributaries that flow into San Francisco Bay. Specific to the proposed project, the BCDC jurisdiction extends to the Petaluma River in Marin and Sonoma counties to its confluence with Adobe Creek and San Antonio Creek to the easterly line of the railroad right-of-way.

3.11.1.3 Local Regulations

Napa County

The Napa County Flood Control and Water Conservation District is responsible for the conservation and management of flood and storm waters to protect life and property, the maintenance of the County watershed using the highest level of environmentally sound practices and providing coordinated planning for water supply needs of the community. The Floodplain Ordinance was adopted by the county in 1980 and Floodplain management is defined in Chapter 16.04 of the Napa County Code.

Marin County

The Marin County Public Works Department oversees the Marin County Flood Control and Water Conservation District. The district was formed in 1955 by an Act of the State Legislature found in Chapter 68 of the State Water Code. The boundaries of the district are those of the County of Marin and eight "zones" established to address specific water quality problems. Floodplain Management is defined in Chapter 23.09 of the Marin County Code.

Sonoma County

In 1996, the County adopted the Flood Damage Prevention Ordinance in Chapter 7B of the Sonoma County Code. The ordinance addresses the construction, location,



extension, conversion, or alteration of structures or land in special flood hazard zones. A development permit is required before the beginning of construction or development within any special flood hazard zone; and the development must be designed and constructed according to specific standards, which include requirements for elevation of construction sites above the base flood elevation by at least 12 inches.

Mendocino County

In 1988, the county adopted Chapter 20.120 of the Mendocino County Zoning Code - Division I. Flood provisions are included in this section for the Inland Unincorporated portion of the County. The SWRCB and the RWQCB are the two authorities with primary responsibility for the maintenance of water quality in the County.

3.11.1.4 City Regulations

Cities that participate in the National Flood Insurance Program are required to have floodplain regulations for activities within the floodplain. Floodplain regulations are intended to ensure that development within the floodplain is safe from flooding and causes no adverse impact on adjacent property, and generally include floodplain mitigation. Floodplain mitigation refers to the measures a community takes to correct and prevent flood risks. These efforts generally include zoning, subdivision, rules for building in floodplains, and special-purpose floodplain ordinances. The following city regulations would apply in respect to the floodplain:

- City of Willits - Chapter 17 - Willits Municipal Code
- City of Ukiah - Chapter 6 - Ukiah City Code
- City of Cloverdale - Title 18 Zoning
- City of Healdsburg - FIRM and Flood Insurance Study Report
- Town of Windsor - Title 27 - Zoning, Flood Hazard Overlay District
- City of Santa Rosa - Title 20 - Zoning Code
- City of Rohnert Park - Title 17 - Zoning Ordinance
- City of Cotati - Chapter 15.04 - Cotati Municipal Code
- City of Petaluma - Article 16 - Zoning and the Floodplain Management Plan



- City of Novato - Flood Damage Prevention Ordinance

3.11.2 Environmental Setting

The environmental setting is based on the information that was available in 2008, when the March 9, 2009 DEIR was first prepared.

The proposed project follows the relatively flat plain that extends northward with elevations ranging from sea level in the south to a high point near Willits of approximately 1,364 feet. The changes in elevation can have some impact on the rainfall microclimate. However, the generally low plains along the route receive lower rainfall than the hills to the west and east of the rail corridor. In the area between Cloverdale and Willits, the elevation increases about 1,000 feet over the course of approximately 50 miles. This rise has little effect on rainfall in the corridor immediately surrounding the tracks, but the mountains to the east and west experience a distinct increase in precipitation. As a result, the more northern section of this track can be expected to experience more runoff from the mountains. The National Oceanic and Atmospheric Administration (NOAA) Atlas, *Precipitation-Frequency Atlas of the Western United States*, identifies peak rainfall events from a two-year through a 100-year 24-hour event. The peak 100-year rainfall event ranges from a low of 6.5 inches to just over 10 inches in 24 hours along the project corridor.

3.11.2.1 Surface Water Resources

The water resources within the proposed project study area occur in a broad range of forms and locations, and varying levels of quality. Surface waterbody types range from seasonal and perennial creeks, sloughs, wetlands, and rivers, including some that exhibit tidal influence from proximity to estuarine waters. The proposed project study area passes through five major watersheds: the Upper Eel River near Willits, Russian River, Petaluma River, Sonoma Creek, and Napa River Watersheds. The Russian and Eel Rivers drain to the Pacific Ocean directly, while the Petaluma River, Sonoma Creek and Napa River Watersheds drain to San Pablo Bay. The Pacific Ocean, San Pablo Bay and the San Francisco Bay are the most significant sinks in the area.

The northernmost portion of the proposed project study area extends for approximately 15 miles into the Upper Eel River Watershed (USGS Cataloging Unit: 18010103). The Upper Eel River Watershed encompasses an area of about 453,075 acres with 1,127



miles of naturally occurring waterways, eventually draining into the Pacific Ocean. The portion of the watershed that will be affected by this section of the rail line is only a small area, limited to the Outlet Creek Sub-basin and Little Lake Valley.

The majority of the proposed project right-of-way, approximately 75 miles of the central part of the corridor, is located within the Russian River Watershed (USGS Cataloging Unit: 18010110). The Russian River basin comprises 950,366 acres of area, and includes almost 1,823 miles of naturally occurring waterways, which carry surface water runoff to the Pacific Ocean. The southern portion of this watershed drains into the Laguna De Santa Rosa, the second largest freshwater wetland in Northern California. The Laguna De Santa Rosa serves as a natural flood detention basin and is a valuable environmental resource. However, erosion and sedimentation have increased over the past several hundred years as a result of development activities which include land clearing, agriculture, urbanization and channelization. As a result, the Laguna's flood storage capacity has been significantly reduced and a loss of wetland area has occurred.

The southern portion of the proposed project lies within the San Francisco Bay Hydrologic Region (HR), which includes the Petaluma River, Sonoma Creek and Napa River Watersheds (USGS Cataloging Unit: 18050002). These watersheds encompass an area of 93,440, 108,800 and 272,640 acres, respectively. These watersheds comprise a portion of the larger San Pablo Bay Watershed. The lower 12 miles of the Petaluma River flow through the Petaluma Marsh, the largest remaining salt marsh in San Pablo Bay. The portion of the Napa Watershed that will be affected is limited to the extreme southern end, making the San Pablo Bay the only body of water at risk from the Napa Watershed. Surface water runoff within the San Francisco Bay HR portion of the proposed project area drains into creeks, streams and rivers, and eventually to San Pablo Bay, a shallow tidal estuary that forms the northern extension of the San Francisco Bay.

In developed locations, stormwater runoff that does not infiltrate into the subsurface is directed into constructed stormwater drainage systems consisting of crowned streets, curbside gutters and drainage inlets. These drainage systems ultimately connect to creeks, streams and rivers.



PUBLIC DRAFT

3.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

3.11 WATER RESOURCES

The surface water resources in the proposed project study area have extremely variable water quality, which is affected by the agricultural practices and the urbanization of the various sub-regions. Ninety-two water bodies are located adjacent to, or are crossed by, the railroad right-of-way. Of the 92, the 51 major bodies of water are listed in Table 3.11-1. Minor bodies of water not included in the table are comprised of small perennial or intermittent streams, unnamed streams, culverts, washouts, drainage ditches or other such waterways that can be considered temporary. Much of the water quality data for the proposed project study area is confined to the Russian River basin or to a limited number of specific sites, collected as a result of discharger self-monitoring requirements, clean-up activities or enforcement actions. With the exception of the Russian River and a few of its tributaries, there are no long-term data for any waterbody in the region.



PUBLIC DRAFT

3.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

3.11 WATER RESOURCES

**Table 3.11-1
Surface Water Resources in the Proposed Project Study Area**

Name	Mile Post	Associated Watershed	Class	Nearest Community	303(d) List Priority Pollutant
MENDOCINO COUNTY					
Willits Creek	140.5, 139.7	Eel River	Perennial stream or river	Willits	None Identified
Broadus Creek	139.3	Eel River	Perennial stream or river	Willits	None Identified
Baechtel Creek	138.9	Eel River	Perennial stream or river	Willits	None Identified
Haehl Creek	138.2, 136.7	Eel River	Perennial stream or river	Willits	None Identified
Bakers Creek	124.7	Russian River	Intermittent stream, river, or wash	Calpella	None Identified
Russian River	122.3, 120.5	Russian River	Perennial stream or river	Calpella	Sedimentation/ Siltation/ Temperature
Salt Hollow Creek	121.3	Russian River		Calpella	None Identified
York Creek	117.6	Russian River		Calpella	None Identified
Hensley Creek	116.4	Russian River	Intermittent stream, river, or wash	Ukiah	None Identified
Ackerman Creek	115.9	Russian River	Intermittent stream, river, or wash	Ukiah	None Identified
Orrs Creek	114.4	Russian River	Intermittent stream, river, or wash	Ukiah	None Identified
Doolin Creek	113.1	Russian River	Intermittent canal, ditch, or aqueduct	Ukiah	None Identified
Robinson Creek	110.4	Russian River	Perennial stream or river	Ukiah	None Identified
McNabb Creek	104.5	Russian River	Perennial stream or river	Hopland	None Identified
Crawford Creek	103.4	Russian River	Intermittent stream, river, or wash	Hopland	None Identified
Feliz Creek	99.7	Russian River		Hopland	None Identified
Cummisky Creek	91.8	Russian River	Perennial stream or river	Hopland	None Identified
Edwards Creek	90.1	Russian River	Perennial stream or river	Hopland	None Identified



**Table 3.11-1 (Continued)
Surface Water Resources in the Proposed Project Study Area**

Name	Mile Post	Associated Watershed	Class	Nearest Community	303(d) List Priority Pollutant
SONOMA COUNTY					
Oat Valley Creek	86.1	Russian River	Intermittent stream, river, or wash	Cloverdale	None Identified
Porterfield Creek	84.3	Russian River	Intermittent stream, river, or wash	Cloverdale	None Identified
Icaria Creek	82.9	Russian River	Perennial stream or river	Cloverdale	None Identified
Barrelli Creek	81.8	Russian River	Perennial stream or river	Cloverdale	None Identified
Peterson Creek	74.7	Russian River	Intermittent stream, river, or wash	Geyserville	None Identified
Lytton Creek	71.7	Russian River	Intermittent stream, river, or wash	Healdsburg	None Identified
Norton Slough	70.3	Russian River	Perennial stream or river	Healdsburg	None Identified
Foss Creek	69.1	Russian River	Perennial stream or river	Healdsburg	Temperature
Russian River	67.6	Russian River	Perennial stream or river	Healdsburg	Sedimentation/ Siltation/ Temperature
Windsor Creek	62.4	Russian River	Perennial stream or river	Windsor	Temperature
Pool Creek	61.3	Russian River	Perennial stream or river	Windsor	Temperature
Mark West Creek	59.5	Russian River	Perennial stream or river	Santa Rosa	Sedimentation/ Siltation/ Temperature
Piner Creek	56.1	Russian River	Perennial stream or river	Santa Rosa	Temperature
Paulin Creek	55.9	Russian River	Perennial stream or river	Santa Rosa	Temperature
Santa Rosa Creek	53.6	Russian River	Perennial stream or river	Santa Rosa	Sedimentation/ Siltation/ Pathogens/ Temperature
Colgan Creek	52.3	Russian River		Santa Rosa	Temperature
Five Creek	49.1	Russian River		South Cotati	None Identified
Hinebaugh Creek	47.5	Petaluma River	Perennial stream or river	Rohnert Park	None Identified
Copeland Creek	47.0	Petaluma River	Perennial stream or river	Rohnert Park	None Identified
Lichau Creek	44.4	Petaluma River	Perennial stream or river	Penngrove	None Identified
Willow Creek	42.4	Petaluma River	Perennial stream or river	Petaluma	Temperature



**Table 3.11-1 (Continued)
Surface Water Resources in the Proposed Project Study Area**

Name	Mile Post	Associated Watershed	Class	Nearest Community	303(d) List Priority Pollutant
Petaluma River	39.7, 38.9, 37.2, & 22.6	Petaluma River	Perennial stream or river	Petaluma	Diazinon/ Nutrients/ Pathogens/ Sedimentation/ Siltation
Schultz Slough	34.2	Petaluma River		Petaluma	Siltation/ Temperature
San Antonio Creek	33.5	Petaluma River	Perennial stream or river	Petaluma	Diazinon
Sonoma Creek	13.6	Sonoma Creek	Perennial stream or river	Schellville	None Identified
Railroad Slough	12.4	Sonoma Creek	Perennial stream or river	Schellville	None Identified
Schell Creek	10.9	Sonoma Creek	Perennial stream or river	Schellville	None Identified
Arroyo Seco	10.6	Sonoma Creek	Perennial stream or river	Schellville	None Identified
MARIN COUNTY					
Novato Creek	26.9, 25.1	Petaluma River	Perennial stream or river	Novato	Diazinon
Simondi Slough	24.2	Petaluma River	Perennial stream or river	Novato	None Identified
Tolay Creek	17.2	Sonoma Creek	Perennial stream or river	Schellville	None Identified
NAPA COUNTY					
Huichica Creek	5.7	Napa River	Perennial stream or river	Lombard	None Identified
Napa River	2.9	Napa River	Perennial stream or river	Lombard	Pathogens/ Sedimentation/ Siltation



3.11.2.2 Floodplains

Figure 3.11-1 shows the general 100-year flood hazard zone along the proposed project corridor. There are approximately 184 bridge and culvert crossings of the rail line along the proposed project corridor, with over half of them within the FEMA floodplain designation of a 100-year flood event.

3.11.2.3 Groundwater

The proposed project study area occurs within the North Coast and San Francisco Bay HR. The North Coast HR includes all or portions of Modoc, Siskiyou, Del Norte, Trinity, Humboldt, Mendocino, Lake, and Sonoma counties and covers approximately 12.46 million acres (19,470 square miles). The North Coast HR also includes small areas of Shasta, Tehama, Glenn, Colusa, and Marin counties. The North Coast HR corresponds to the boundary of the RWQCB's Region 1. The San Francisco Bay HR covers approximately 2.88 million acres (4,500 square miles) and includes all of San Francisco and portions of Marin, Sonoma, Napa, Solano, San Mateo, Santa Clara, Contra Costa, and Alameda counties. This region corresponds to the RWQCB boundary for its Region 2.

In general, both of these regions possess groundwater quality suitable for most urban and agricultural uses, with only local impairments. Groundwater is typically defined as the part of the subsurface water within the zone of saturation. Total dissolved solids (TDS), nitrate, boron, and organic compounds are the primary constituents of concern. Areas exhibiting high concentrations of TDS (and chloride) are found in the region's groundwater basins situated near the San Francisco Bay, such as southern Sonoma, Petaluma and Napa Valleys. In basins within Sonoma County, iron, boron and manganese are also problematic. There is a high range of variability for depth to groundwater along the proposed project study area, caused by the various soil types and geological features. Depth to groundwater data was obtained from the California DWR, and is broken down by city in Table 3.11-2.



**Table 3.11-2
Depth to Groundwater Data**

Community	Groundwater Range Below Ground Surface (bgs)
Willits	2 feet to 25 feet
Redwood Valley	5.6 feet
Calpella	18.3 feet
Ukiah	10.2 feet to 15.7 feet
Hopland	4.7 feet to 15.1 feet
Cloverdale	4.86 feet to 9.37 feet
Asti	15.85 feet to 20.25 feet
Geyserville	4.45 feet to 8.34 feet
Healdsburg	5.41 feet to 10.09 feet
Windsor	1.85 feet to 36.66 feet
Santa Rosa	6.0 feet to 22.81 feet
Rohnert Park	4.12 feet to 11.43 feet
Cotati	6.67 feet to 28.00 feet
Petaluma	4.96 feet to 9.13 feet
Novato	4.43 feet to 7.73 feet
Schellville	1.5 feet to 40.3 feet

Source: Well log data; California Department of Water Resources, 1962-2000.

In the North Coast HR, development of groundwater resources occurs along the coast, near the mouths of major rivers, on the marine terraces, or in the inland river valleys and basins. The reliability of these groundwater supplies varies considerably between areas within the region. There are 63 groundwater basins/sub-basins delineated in this region.

The San Francisco Bay HR has 28 groundwater basins identified, of which, one of those, the Napa-Sonoma Valley groundwater basin, is further divided into three sub-basins: Napa Valley, Sonoma Valley and Napa-Sonoma Lowlands. Groundwater use accounts for only about five percent (68,000 acre-feet) of the San Francisco Bay region's estimated average water supply for agricultural and urban uses, and accounts for less than one percent of statewide groundwater uses.

3.11.2.4 Environmental Setting at Rehabilitation and Construction Sites

Bakers Creek

Bakers Creek is a tributary to Forsythe Creek. Forsythe Creek is a tributary to the Russian River located within the Redwood Valley area between Willits and Ukiah in



Mendocino County. Bakers Creek and its tributaries drain a basin of approximately 2.3 square miles. Bakers Creek is a small intermittent system but channels large flows during storm events year round.

In December 2005 blockage of the culvert during heavy storms led to the impoundment of water behind the embankment and eventual overtopping, resulting in failure of the embankment and flooding as far as one mile downstream (see Section 3.4, Geology for a description of this event).

Foss Creek

Foss Creek is a small tributary to West Slough that flows into the Russian River just south of the city of Healdsburg in Sonoma County. Foss Creek is a relatively small drainage, less than one square mile, which has been channelized as it flows through the city. Since the creek runs through the city, and crosses under many roadways, it is an important drainage for stormwater, and likely has significant flow variations during the rainy season. High runoff from heavy storms in the winter of 2005-2006 caused a channelized portion of Foss Creek to meander eastward and undermine the retaining wall protecting the railroad tracks. The creek has continued to scour the site and severely damaged a 200-foot section of the railroad embankment, removing ballast and ties that support the railroad track.

Black Point Bridge-Petaluma River

The Black Point Bridge is located on the Petaluma River just south of Highway 37 near the mouth where the river flows into San Pablo Bay. The Petaluma River watershed encompasses 146 square miles located in southern Sonoma County and a portion of Marin County. The Black Point Bridge crosses over the Petaluma River at a point where the river is tidally influenced and approximately 800 feet across. Tidal marsh wetlands border the area where the bridge crosses the river.

Lombard Siding (MP 1.0 – MP 2.0)

This proposed new siding would be 5300 feet long located between MP 1.0 and MP 2.0 near Lombard in Napa County. Construction of the siding will include grading, placement of track ballast and clean fill, extending and installing culverts, and reestablishing drainage ditches. The proposed siding will be located 15 feet south of



and parallel to the main line. At the western end of the proposed siding along this stretch of right-of-way, mudflats/diked historic baylands extend from the toe of the slope of the railroad bed beyond the limits of the right-of-way. Historically, these areas occurred within the floodplain of the Napa River but now primarily receive water from rainfall.

Seasonal wetland habitat occurs sporadically along both sides of the railroad bed and generally extends an average of 6-12 feet into the right-of-way from the toe of slope of the bed. Most of the seasonal wetlands appear to be artificial in origin and function as drainage ditches that parallel the mainline with the exception of a 15' wide swale that drains under the track at MP 1.37.

Construction of the proposed siding in this area will cover a width of approximately 15 feet of mudflat extending from the toe of slope for a total impact of 0.69 acre (30,000 square feet) to mudflat habitat. In addition, seasonal wetland habitat extending approximately 1,000 linear feet and ranging from 6-12 feet wide was identified within the limits of the proposed Lombard siding, for a total area of approximately 0.2 acres of seasonal wetlands.

Novato Consent Decree (MP 35.5 – MP 18.7)

Improvements required by the Novato Consent Decree include establishing quiet zones involving improvements at fourteen or more crossings, welding of rails, fencing as required for safety, and landscaping to reduce the effects of glare from trains running after dusk.

The crossings identified in the Novato Consent Decree and the milepost designations are as follows:

1. Rush Creek Place (MP 28.5);
2. Golden Gate Place (MP 28.4);
3. Olive Avenue (MP 28.3);
4. Grant Avenue (MP 28.1);
5. Pedestrian/Bike Crossing (Manuel Drive) (MP 27.5);
6. Novato Creek (Private) (MP 26.9);



7. Wetlands Access (Private) (MP 26.2);
8. Hanna Ranch Road (MP 25.9);
9. Private Crossing (Highway 37) (MP 24.4);
10. Renaissance Road (MP 23.5);
11. Private Crossing (Harbor Drive Business Park) (MP 23.2);
12. Grandview Avenue (MP 23.0);
13. Private Driveway (Hunter's Club Drive) (MP 22.9);
14. Trail crossings immediately to the east of Petaluma River (MP 21.9); and
15. Other intersections of the NWP Line with pedestrian trails or vehicular right-of-ways as may be required or recommended by the regulatory agencies.

Crossing Nos. 1 through 14 are existing crossings that are either developed (paved roads) or unpaved roads and trails where the ground has been disturbed by vehicular or pedestrian traffic. Specific improvements at crossings vary depending on the type of crossing (public road vs. private or pedestrian), size of the street, and volume of traffic. They include construction of short mountable medians, 3-foot wide medians, quad gates, short pedestrian gates and swing gates, and signage. Except for part of a 200 foot median strip that extends off of the railroad right-of-way at Hanna Ranch Road, road improvements, gates, and signage will be constructed on existing roads or disturbed areas adjacent to the crossings. The biological assessment (Biological Field Report, Appendix E) indicates that no wetlands or water courses are present at the identified locations where these improvements will be constructed.

Fencing will be established on both sides of the track from north of Rush Creek Place to south of Hanna Ranch Road. Most of this part of the railroad line runs through the urban district of Novato and is paved or disturbed. The biological assessment indicates that wetlands ranging from natural tidal wetlands flanking the railroad right-of-way to local ponds within unmaintained swales within the right-of-way, and water courses that cross the track through culverts, are present throughout this area.



3.11.3 Impacts and Mitigation Measures

3.11.3.1 *Significance Criteria*

CEQA defines a significant effect on the environment as a substantial, or potentially substantial, adverse change in the physical conditions within the area affected by the project. Based on the location of the project and existing hydrology, drainage, and groundwater conditions, a project impact related to water quality or groundwater would be considered significant if it were to result in the following:

- Violate any water quality standards or waste discharge requirements;
- 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 for which permits have been granted);
- Substantially alter existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on or off-site;
- Create or contribute runoff water, which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff;
- Otherwise substantially degrade water quality;
- Place within a 100-year flood hazard area, structures that would impede or redirect flood flows;
- Expose people or structures to a significant risk of loss, injury or death involving flooding, as a result of the failure of a levee or dam; or
- Inundation by seiche, tsunami, or mudflow.

3.11.3.2 *Impact Assessment Methodology*

Existing hydraulic and water quality conditions were evaluated qualitatively in the study area, and in accordance with standard professional practice. Key sources of information consulted on existing hydrologic conditions included the following:



- California DWR, 1975 Bulletin Number 118-4;
- Geology and Ground Water in the Santa Rosa and Petaluma Areas, Sonoma County, California. (G.T. Cardwell, 1958);
- Soil Survey: Sonoma County, California (Miller, 1972);
- California Rivers Assessment: Assembling Environmental Data to Characterize California's Watersheds (Viers, et al, 1998);
- 2005 CEQA: California Environmental Quality Act, Statutes and Guidelines (Office of Planning and Research); and
- Assessment of Biological Health of Riparian Wetlands (Southern Sonoma County Resource Conservation District, 2004).

3.11.3.3 *Impacts and Mitigations*

Rehabilitation and Construction Activities

Baker Creek, Foss Creek, and the Lombard Siding MP 1.0 - MP 2.0 involve the placement of fill, and Black Point Bridge involves electrical and mechanical repairs. Potential impacts from these rehabilitation and construction activities of the project were assessed separately for each of the sites. Minor rehabilitation, and ongoing maintenance, and routine repair activities were also evaluated. Agency consultation will be conducted during the permitting phase for these sites and activities, as appropriate.

Bakers Creek

A portion of the embankment at this site was completely removed during flooding and flood control operations in 2006. The railroad track runs along the embankment at an elevation of about 50 feet above the stream bed of Bakers Creek. Rather than replacement with a standard culvert, NCRA plans to construct a concrete arch across the creek bed, then place fill material on top of the arch to create the new embankment for the railroad tracks. This concrete arch will allow for natural water flow and sediment transport along Bakers Creek at this location.

Impact WR-BC1: During construction for rehabilitating the railway at the Bakers Creek site, construction activities will require the transport, placement of fill, and structural features that could potentially result in erosion, increased sedimentation and possibly



alterations to stream flows. ***[Less Than Significant with Mitigation Measures WR-BC1a, WR-BC1b, WR-BC1c, and WR-BC1d]***

Mitigation WR-BC1a: The proposed project shall comply with the NPDES permit process which requires project applicants to file a NOI and prepare and submit a construction SWPPP to the RWQCB. The SWPPP will contain a detailed mitigation plan containing BMPs for erosion and sediment control. Typical BMPs may include the use of silt fencing, temporary or permanent retention or detention basins, check dams, buffer strips adjacent to streams, and other similar devices or methods.

Mitigation WR-BC1b: The proposed project shall comply with all requirements necessary for a Streambed Alteration Agreement from the California Department of Fish and Game.

Mitigation WR-BC1c: The proposed project design for this site shall adhere to the guidelines for fish passage set forth by the California Department of Fish and Game and the National Marine Fisheries Service. These agencies shall be consulted with prior to finalization of the design to assure success and minimize potential impacts.

Mitigation WR-BC1d: The proposed project shall comply with the WDRs issued by the RWQCBs.

Impact WR-BC2: Rehabilitation activities could cause adverse impacts on surface waters through the release of hydrocarbons and similar pollutants. During construction, the operation of equipment and vehicles in close proximity to surface water bodies could result in accidental discharges of oil or other contaminants into streams. ***[Less Than Significant with Mitigation Measure WR-BC2]***

Mitigation WR-BC2: Construction activities shall be restricted to the approved work window (dry season) as designated by the regulatory agencies. NCRA shall implement procedures, BMPs, and monitoring programs as required by the regulatory agencies.

Foss Creek

A portion of the railroad embankment at this site has been severely eroded by water flowing in Foss Creek. This portion of Foss Creek has been channelized and during the high flow periods, the bank has been scouring the sediments along the embankment



causing a timber retaining wall that protects the railroad embankment to fail. To restore the embankment, NCRA plans to install sheet piles along the edge of the eroded embankment, then backfill it and place riprap along the creek-side base.

Constructing this new embankment in this manner may temporarily impact water resources. Both the construction activities and the permanent alterations caused by the rehabilitation have been evaluated. The placement of fill and operation of heavy equipment may impact water quality.

Impact WR-FC1: During construction for rehabilitating the railway at the Foss Creek site, construction activities will require the transport, placement of fill, and placement of structural features that could potentially result in erosion, increased sedimentation and possibly alterations to stream flows. *[Less Than Significant with Mitigation Measures WR-FC1a, WR-FC1b, WR-FC1c, and WR-FC1d]*

Mitigation WR-FC1a: The proposed project shall comply with the NPDES permit process which requires project applicants to file a NOI and prepare and submit a construction SWPPP to the RWQCB. The SWPPP will contain a detailed mitigation plan containing BMPs for erosion and sediment control. Typical BMPs may include the use of silt fencing, temporary or permanent retention or detention basins, check dams, buffer strips adjacent to streams, and other similar devices or methods.

Mitigation WR-FC1b: The proposed project shall comply with all requirements necessary for a Streambed Alteration Agreement from the California Department of Fish and Game and the WDRs from the RWQCB.

Mitigation WR-FC1c: The proposed project design for this site shall adhere to the guidelines for fish passage set forth by the CDFG and the NMFS. These agencies shall be consulted with prior to finalization of the design to assure success and minimization of potential impacts.

Mitigation WR-FC1d: The proposed project shall comply with the WDRs issued by the RWQCBs.

Impact WR-FC2: Rehabilitation activities could cause adverse impacts on surface waters through the release of hydrocarbons and similar pollutants. During construction, the operation of equipment and vehicles in close proximity to surface water bodies could



result in accidental discharges of oil or other contaminants into streams. ***[Less Than Significant with Mitigation Measure WR-FC2]***

Mitigation WR-FC2: Construction activities shall be restricted to the approved work window (dry season) as designated by the regulatory agencies. NCRA shall implement procedures, agency approved BMPs, and monitoring programs as required by regulatory agencies.

Black Point Bridge

The rehabilitation of Black Point Bridge involves modifying and replacing the mechanical and electrical systems of the swing span. The work will be conducted on the bridge. No significant impacts to water resources are anticipated from rehabilitating this bridge.

Lombard Siding (MP 1.0 – MP 2.0)

Construction of the siding from MP 1.0 to MP 2.0 will include grading, placement of track ballast and clean fill, placement of 5,300 feet of new track, extending a culvert, reestablishing drainage ditches, widening an existing timber deck bridge, the embankment, and constructing culverts. There are open grasslands and wetlands along with commercial properties adjacent to the right-of-way in the project area.

Impact WR-LS1: The siding from MP 1.0 to MP 2.0 is located in an area that is partially occupied by wetlands. Construction of the new siding and ongoing maintenance activities related to the operations of the railroad will be conducted in accordance with NCRA's BMPs, but will impact sensitive habitats due to the filling of 0.2 acres of seasonal wetlands and loss of 0.69 acres of mudflat habitats. ***[Less Than Significant with Mitigation Measure WR-LS1]***

Mitigation WR-LS1: The wetlands and mudflats will be fully evaluated and confirmed in coordination with permitting and resource agencies. Losses of the habitats will be mitigated by creation of an equivalent habitat at a 1:1 ratio, or other compensatory mitigation determined appropriate by the permitting agencies.

Impact WR-LS2: During construction of the siding from MP 1.0 to MP 2.0, construction activities will require the transport, placement of fill, and placement of structural features



that could potentially result in erosion and increased sedimentation. ***[Less Than Significant with Mitigation Measures WR-LS2a and WR-LS2b]***

Mitigation WR-LS2a: The proposed project shall comply with the NPDES permit process which requires project applicants to file a NOI and prepare and submit a construction SWPPP to the RWQCB. The SWPPP will contain a detailed mitigation plan containing BMPs for erosion and sediment control. Typical BMPs may include the use of silt fencing, temporary or permanent retention or detention basins, check dams, buffer strips adjacent to streams, and other similar devices or methods.

Mitigation WR-LS2b: The proposed project shall comply with all requirements necessary from the CDFG and the WDRs from the RWQCB.

Impact WR-LS3: Rehabilitation activities could cause adverse impacts on surface waters through the release of hydrocarbons and similar pollutants. During construction, the operation of equipment and vehicles in close proximity to surface water bodies could result in accidental discharges of oil or other contaminants into wetlands. ***[Less Than Significant with Mitigation Measure WR-LS3]***

Mitigation WR-LS3: NCRA shall implement procedures, agency approved BMPs, and monitoring programs as required by the regulatory agencies.

Novato Consent Decree (MP 35.5 – MP 18.7)

Quiet zone improvements such as medians, gates, and signage at the existing crossings will be constructed on land that is either paved or disturbed. As a result, no impacts to water resources are expected in these specific areas. However, according to the Novato Consent Decree, other intersections with pedestrian trails or vehicular right-of-ways may be required or recommended by regulatory agencies.

Although fencing will be established on both sides of the track between Rush Creek Place to south of Hanna Ranch Road, and the locations and type of fencing will be determined by the City of Novato following an inspection of the rail line, the construction of fencing is considered a minor project and would not likely impact water resources.



Impact WR-NCD1: There could be disturbance of wetlands/waters of the United States during construction of quiet zone improvements if additional intersections of the NWP Line requiring quiet zone improvements are identified by the regulatory agencies.

Construction activities could impact wetlands and other waters at the quiet zone sites. Operation of vehicles and equipment in these areas could adversely affect wetland and stream habitat by disrupting soil and damaging or removing wetland and riparian vegetation. Ground disturbance and other activities within and adjacent to stream zones could result in increased erosion, water turbidity and sediment transport into waterways.

[Less Than Significant with Mitigation Measure WR-NCD1]

Mitigation WR-NCD1: Local jurisdictions and state and federal agencies shall be consulted prior to work to ascertain any requirements to protect water resources. Work shall be conducted in compliance with any specific permit requirements, and the NCRA BMPs. Upon completion of the construction work at the site, all temporarily disturbed natural areas (if any), including stream banks, shall be returned to original contours and in accordance with the permit requirements. Affected wetlands, stream banks or stream channels shall be stabilized prior to the rainy season and/or prior to reestablishing flow.

Operations

NCRA shall implement procedures, BMPs, Operations Plans and monitoring programs as required by regulatory agencies. These plans and procedures also address many long-term changes that may occur, such as water-level rise. Continuance of railroad operations requires routine and emergency repairs. As conditions change, such as rising water levels or increased rainfall runoff, the stream channels and embankments need to be maintained in a fashion to assure safe rail operations. In the event that major repairs or structural alterations are required at some future point, they will be evaluated at that time to determine permitting needs and additional BMPs.

The proposed project will not include any permanent alterations of terrain that would affect watershed hydrology. The proposed project will have a negligible impact on peak flow rates or flood volumes. Over the years, many of the stream crossings along the rail corridor have become clogged with debris, which has caused erosion of surface and side slopes. Prior to the operation of the railroad, these bridges and culverts will be cleared, resized, or reconstructed, as necessary, to re-establish adequate hydrologic



connections and minimize sediment delivery to the water resources listed in Table 3.11-1.

Impact WR-OP1: Water crossings could become clogged with debris that could reduce drainage capacity and cause structural failure of culverts or bridges. This debris could impede water flow within a designated 100-year flood plain. Inadequate drainage could also cause excessive erosion that could compromise the railroad embankment in the vicinity of the crossings. ***[Less Than Significant with Mitigation Measure WR-OP1]***

Mitigation WR-OP1: NCRA's BMPs, Operations Plans and monitoring programs shall be implemented. These plans and procedures outline routine maintenance of the rail line which shall include regular inspection and clearing of debris at stream crossings. Routine inspection and debris removal will help prevent clogging and deterioration of drainage facilities. Maintaining adequate drainage will reduce the risk of flooding that can occur when surface water accumulates behind clogged culverts and/or bridges, resulting in a long-term beneficial effect. Proper maintenance will also prevent damage to bridge and water control structures, and help prevent erosion of the railroad embankment and adjacent upland areas.

Impact WR-OP2: Routine maintenance activities could temporarily increase surface erosion, sedimentation and stream flow alterations due to temporary work performed in the water. ***[Less Than Significant with Mitigation Measures WR-OP2a, WR-OP2b, and WR-OP2c]***

Mitigation WR-OP2a: Routine maintenance activities shall comply with any applicable NPDES permit process requirements. If applicable, a NOI and construction SWPPP shall be prepared and submitted to the RWQCB. The SWPPP will contain a detailed mitigation plan containing BMPs for erosion and sediment control.

Mitigation WR-OP2b: Routine maintenance activities shall adhere to the guidelines for fish passage set forth by the CDFG and the NMFS. When working in water, these agencies shall be consulted with prior to finalization of the design to assure success and minimization of potential impacts.

Mitigation WR- OP2c: Routine maintenance activities shall comply with any applicable WDRs issued by the RWQCBs.



Impact WR-OP3: Routine maintenance activities occurring in water at bridges or culverts could cause adverse impacts on surface waters through the release of hydrocarbons and similar pollutants. During maintenance activities, the operation of equipment and vehicles in close proximity to surface water bodies could result in accidental discharges of oil or other contaminants into streams. ***[Less Than Significant with Mitigation Measure WR-OP3]***

Mitigation WR-OP3: Accidental spills from routine maintenance activities shall be avoided by implementing NCRA's BMPs and Operations Plans. The BMPs and/or plans incorporate exclusion zones adjacent to streams and other bodies of water, and specific procedures for spill containment and cleanup in the event of an accident. Protocols shall be followed for oversight and inspection of construction activities to assure compliance with the operations plans.

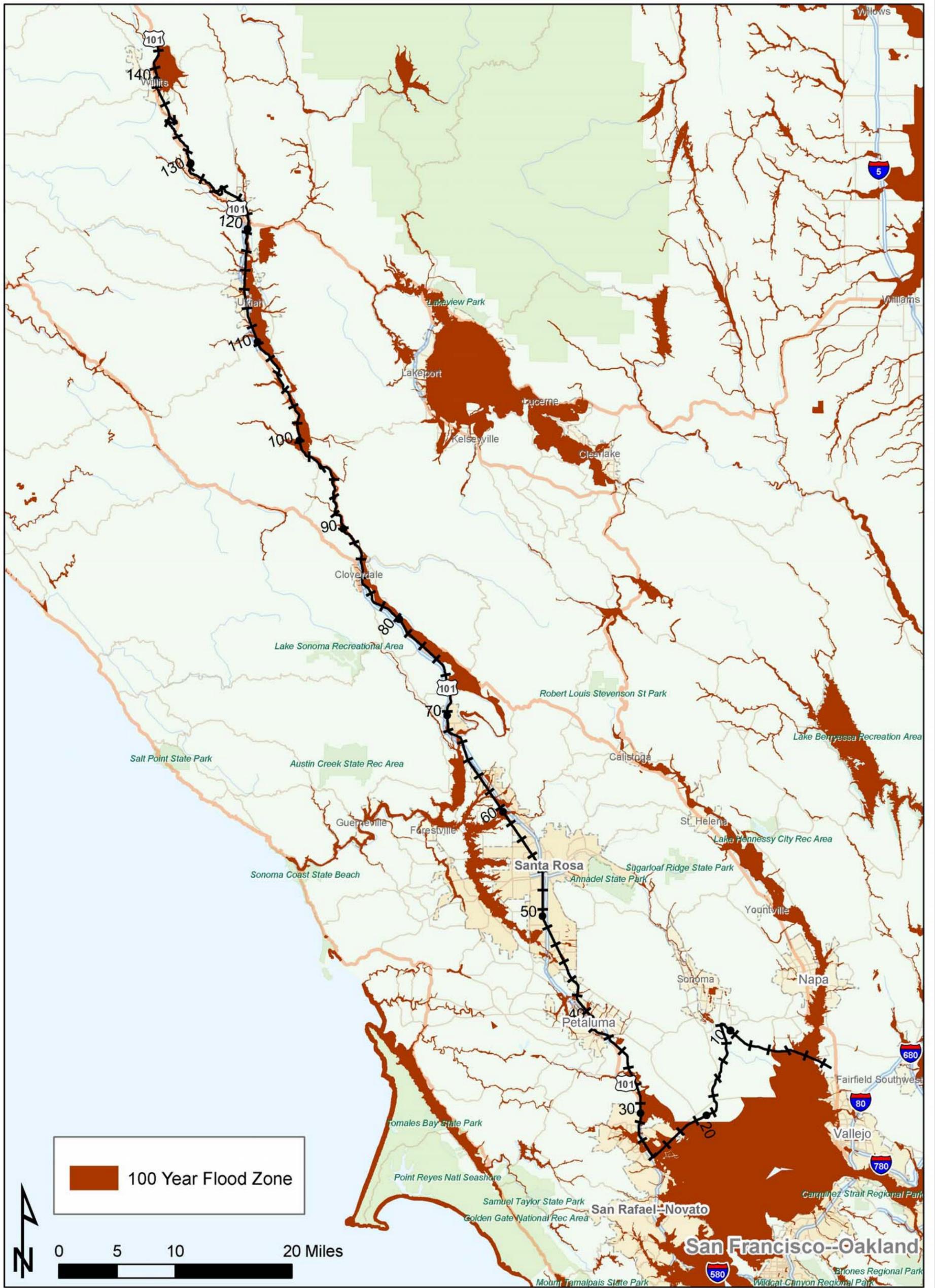


PUBLIC DRAFT

3.0 ENVIRONMENTAL SETTING, IMPACTS, AND MITIGATION MEASURES

3.11 WATER RESOURCES

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PROJECT NO.	78207
DRAWN:	5/10/08
DRAWN BY:	IPM
CHECKED BY:	BE
FILE NAME:	Figure 3.11-1

**100 YEAR FLOOD ZONES
ALONG THE PROPOSED
PROJECT LINE**

NORTH COAST RAILROAD AUTHORITY
RUSSIAN RIVER DIVISION
FREIGHT RAIL PROJECT

FIGURE

3.11-1