3.3 WATER RESOURCES

This section examines the proposed project with respect to the potential impacts on hydrology, surface water quality, groundwater, flooding, and stormwater runoff. Effects on wetland resources are analyzed in Section 3.9, Biological Resources. No impacts on water supply or public drinking water sources were identified.

This analysis describes the impacts on all surface water sources including the Section 303(d) list of water bodies in the proposed project vicinity that have pollutants that cannot be completely managed. This analysis also looks at the potential impacts on flooding due to the proposed rail line improvements. Bridges, culverts and rail stations were identified and a determination was made as to whether the identified structures are within a designated floodplain by reviewing the Federal Emergency Management Agency's (FEMA) Flood Insurance Rate Maps (FIRMs). Additional detailed information is in the *Hydrology and Water Quality Assessment* (Winzler & Kelly, 2004) prepared for this project.

3.3.1 Regulatory Setting

Federal Regulations

Clean Water Act

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the waters of the United States (U.S.) and has given the Environmental Protection Agency (EPA) the authority to implement pollution control programs. The CWA also contains requirements that set water quality standards for all contaminants in surface waters. The CWA makes it unlawful for any person to discharge any pollutant from a point source into navigable waters, unless a permit is obtained under the provision. A point source of pollution is one that can be easily identified such as pipe leading from industrial and wastewater treatment plants.

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

National Pollution Discharge Elimination System

The National Pollution Discharge Elimination System (NPDES) Nonpoint Source Program (established through the CWA) regulates runoff water quality; the NPDES program objective is to control and reduce pollutants to waterbodies from nonpoint discharges. Nonpoint source (NPS) pollution, unlike 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. As the runoff moves, it picks up and carries away natural and human-made pollutants, finally depositing them into lakes, rivers, wetlands, coastal waters, and even underground sources of drinking water. The program and permit are administered by the Regional Water Quality Control Board (RWQCB), as determined by the EPA and the State Water Resources Control Board (SWRCB). An NPDES permit is needed for any construction activity that will, 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 to a waterbody of the U.S.

Section 404 Permit

Section 404 establishes programs to regulate the discharge of dredged and fill material in waters of the U.S., including wetlands. When an application for a Section 404 permit is made the applicant must show it has:

- Taken steps to avoid wetland impacts where practicable;
- Minimized potential impacts on wetlands; and
- Provided compensation for any remaining unavoidable impacts through activities to restore or create wetlands.

Wetlands are addressed in Section 3.9 of this DEIR.

Section 401 Permit

In order for any work to be completed around the various surface waterbodies, Section 401 of the CWA would be applicable. Section 401 requires any applicant for a federal permit that conducts any activity that may result in a discharge of pollutants to first obtain a Water Quality Certification (WQC) from the state.

Section 10 Permit

In addition to the above permits, Section 10 of the Rivers and Harbors Act may be applicable if the affected waterbody is designated "Navigable." Section 10 requires authorization from the Army Corps of Engineers 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.

Executive Order 11988/Federal Emergency Management Agency

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. Each federal agency is responsible for preparing procedures for carrying out the provisions of the Order. Federal agencies consult with FEMA concerning implementation of the Executive Order and base their decision on a set of guidelines to decide if a project will have any potential impacts to or within the floodplain.

FEMA has conducted flood analysis studies throughout California that have resulted in the development of FIRMs. FIRMs identify the estimated limits of the 100-year and 500-year flood event 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.

Executive Order 11988 applies to acquisition, new construction, and most rehabilitation activities that are undertaken with Federal assistance within special flood hazard areas designated by FEMA. FEMA has designated flood hazard areas within the proposed project area in terms of Flood Hazard Boundary Maps and/or Flood Insurance Rate Maps and would require compliance with the 8-step decision-making process.

Any projects within a floodplain require a detailed analysis in the environmental document as specified in the U.S. Department of Transportation Order 5650.2 *Floodplain Management and Protection* (April 23, 1979). The analysis is to discuss any risk to or resulting from the action; the impacts on natural and beneficial floodplain values; the degree to which the action provides direct or indirect support for development in the floodplain; and measures to minimize harm or to restore or preserve the natural and beneficial floodplain values affected by the proposed project.

State Regulations

State Water Resources Control Board (SWRCB)

The SWRCB and the nine RWQCBs throughout California regulate water quality in surface and groundwater bodies. The SWRCB regulates water quality through the Porter-Cologne Water Quality Act of 1969. Porter-Cologne contains a complete framework for the regulation of waste discharges to both surface waters and groundwaters of the state.

On the regional level, the proposed project falls under the jurisdiction of the North Coast Region RWQCB and the San Francisco Bay RWQCB, which are responsible for the implementation of state and federal water quality protection statutes, regulations and guidelines near the project site. The State and Regional Water Quality Control Boards would play a major role in the permitting process of the proposed project.

Lake or Streambed Alteration Agreement

Since work for the proposed project would be completed along the banks of various surface water bodies (identified in Section 3.3.2), an application for a Lake or Streambed Alteration Agreement would be required. Section 1602 of the California Department of 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 Department before beginning the project.

Bay Conservation and Development Commission

A Bay Conservation and Development Commission (BCDC) permit may also be required if construction occurs within 100 feet of the mean high tide. BCDC is charged with administering the federal Coastal Zone Management Act within the San Francisco Bay segment of the California coastal zone to ensure that federal activities reflect Commission policies. 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 NWP right-of-way.

Dredging Permits

Should dredging occur in surface water along the corridor right-of-way, a dredging permit will be obtained through the Dredged Material Management Office (DMMO) of the BCDC. The DMMO is a joint program of the BCDC, RWQCB, State Land Commission (SLC), the San Francisco District U.S. Army Corps of Engineers (ACOE) and the EPA. The California Department of Fish and Game, the National Marine Fisheries Service, and the Fish and Wildlife Service provide advice and expertise to the process. The purpose of the DMMO is to cooperatively review sediment quality sampling plans, analyze the results of

sediment quality sampling, and make suitability determinations for the material proposed for disposal in the San Francisco Bay.

Local Regulations

Marin County Public Works Department

The Marin County Public Works Department staffs 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.

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.

City Regulations

All cities and counties participating in the National Flood Insurance Program have floodplain regulations for activities within the floodplain. Floodplain regulations are intended to ensure that floodplain development is safe from flooding and causes no adverse impact on adjacent property and generally includes 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 Cloverdale – Title 18 Zoning
- City of Healdsburg – FIRM and Flood Insurance Study Report
- City 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 Petaluma – Article 16 – Zoning and the Floodplain Management Plan
- City of Novato – Flood Damage Prevention Ordinance
- City of San Rafael – Title 14 – Zoning Ordinance
- City of Larkspur – Title 18 Zoning

3.3.2 Environmental Setting

Generally, the water resources study area extends ¼ mile from the SMART railroad right-of-way in Sonoma and Marin counties; in a few instances the study area was expanded to address potentially impacted resources that fall within a ½ or one-mile range. The proposed project follows the relatively flat plain that extends northward with elevations ranging from sea level in the south to a high point in Cloverdale of approximately 300 feet. The changes in elevation can have some impact on the rainfall microclimate. However, the generally low plains along the route translate to lower rainfall than in the hills to the west and east of the rail corridor. 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.

Surface Water Resources

The water resources within the proposed project area exist in various forms, locations and levels of quality. Surface waterbodies range from seasonal and perennial creeks, sloughs, wetlands, and rivers, with tidal influence draining into major watersheds. The most significant watersheds in the project corridor are the Russian River, Petaluma River, San Pablo Bay, and San Francisco Bay.

The majority of the proposed project, approximately 40 miles, is located within the Russian River Watershed (USGS Cataloging Unit: 18010110). Comprising approximately 950,366 acres, the Russian River basin includes almost 1,823 miles of naturally occurring waterways, some of which cross the project corridor. Surface water runoff within the Russian River Watershed drains to the Pacific Ocean. A portion of this watershed first drains to the Laguna De Santa Rosa, which is the Russian River's largest tributary and the second largest freshwater wetland in Northern California. As a valuable environmental resource, Laguna De Santa Rosa serves as a natural flood detention basin. However, development over the past several hundred years, including land clearance, farming, urbanization and channelization, has accelerated erosion and sedimentation, which has reduced the Laguna's flood storage capacity and caused loss of wetland area. Laguna De Santa Rosa is a 100 percent impaired waterbody.

A smaller portion of the proposed project lies within the San Francisco Bay Hydrologic Region (HR), which includes the San Pablo Bay Watershed and the Petaluma River (USGS Cataloging Unit: 18050002). Surface water runoff within the San Francisco Bay HR portion of the proposed project area drains into creeks, streams and rivers, and eventually to 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.

Water quality from surface water sources in the project area is extremely variable depending on the agricultural practices and the urbanization of the various sub-regions. Approximately 40 waterbodies are located adjacent to or are crossed by the proposed project corridor right-of-way (see Table 3.3-1). Table 3.3-1 lists two crossings each for the Russian River, Petaluma River and Petaluma Marsh for a total of 43 waterbodies. Table 3.3-1 also indicates which surface waterbodies are listed by the SWRCB under Section 303(d) of the CWA (see discussion in Regulatory Setting) and includes the type of priority pollutant. Much of the water quality data for the project 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, cleanup activities or enforcement actions. With the exception of the Russian River and a few of its tributaries, there are no long-term data on any waterbody in the region.

Floodplains

There are close to 70 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 or 500-year flood event. The flood Insurance Rate Maps indicate that portions of the proposed project corridor are within the 100-year and 500-year flood hazard areas. Areas located within the 100-year flood hazard zone may be inundated during the 100-year (or greater magnitude) storm event. Figure 3.3-1 shows the general 100-year flood hazard zone along the proposed project corridor. The 100-year storm is expected to occur, on average, once every 100 years. Areas shown within the 500-year flood hazard zone are areas between the 100-year and the 500-year floodplains, or certain areas subject to the 100-year flood with average depths of inundation less than one foot.

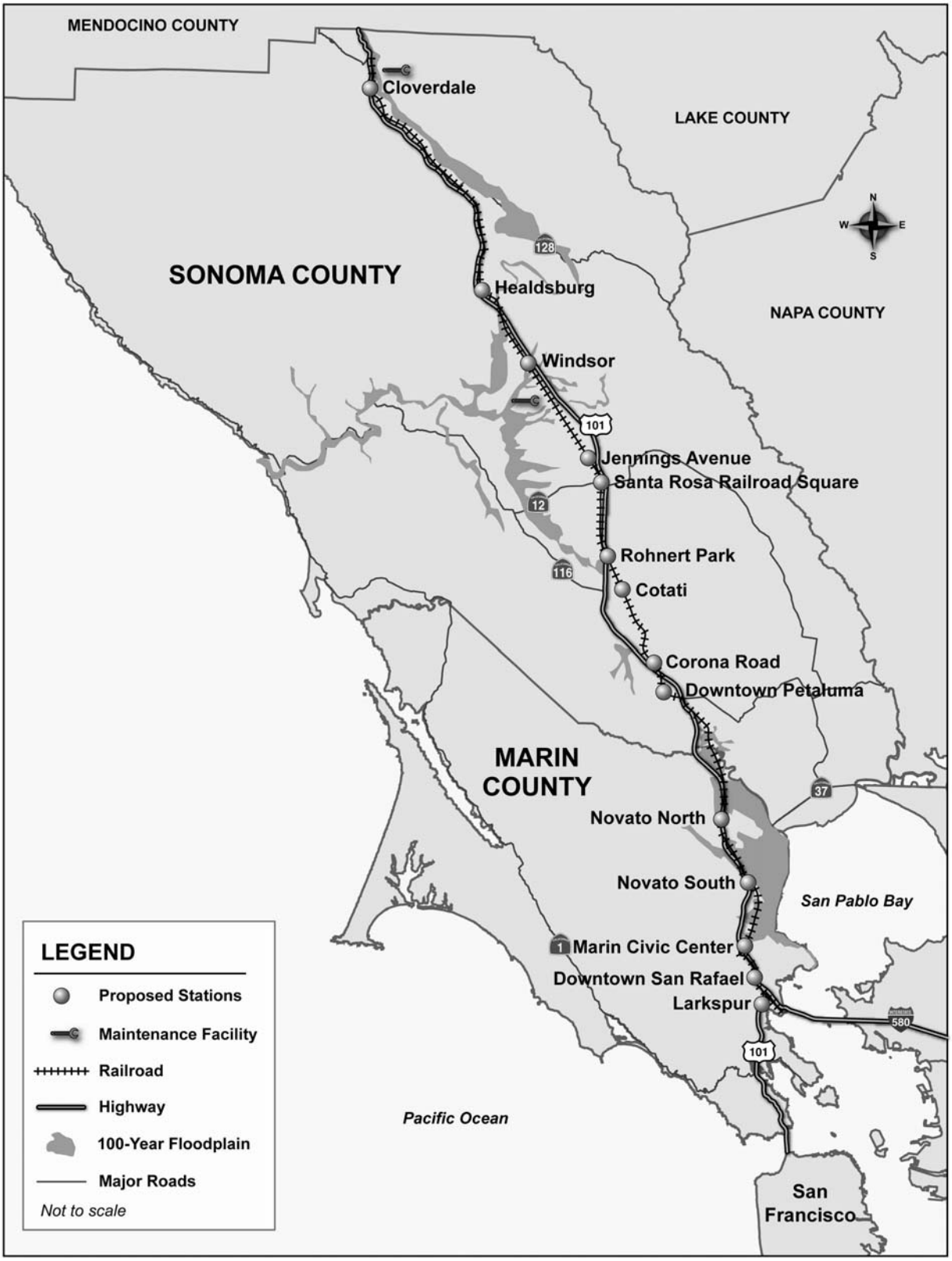
TABLE 3.3-1
WATERBODIES WITHIN THE PROPOSED PROJECT AREA

Waterbody Name	Approximate Mile Post	Nearest Community	Proximity to Proposed Project Corridor	Priority Pollutant 303(D) List	Tributary
Russian River	85.0	Cloverdale, Geyserville,	Parallels corridor to the east	Sedimentation/ Siltation/ Temperature	
Porterfield Creek		Cloverdale Rancheria	Culvert Crossing	None identified	Russian River
Icaria Creek	82.5	Cloverdale	Culvert Crossing	None identified	Russian River
Barrelli Creek	81.8	Asti	Bridge Crossing	None identified	Russian River
Unnamed	78.7	N. Chianti	Bridge Crossing	None identified	Russian River
Unnamed	78.2	S. Chianti	Culvert Crossing	None identified	Russian River
Wood Creek	76.5	Geyserville	Culvert Crossing	None identified	Russian River
Peterson Creek	74.8	Nervo	Bridge Crossing	None identified	Russian River
Lytton Creek	72.8	Lytton	Bridge Crossing	None identified	Russian River
Norton Slough	69.2	Simi	Located adjacent to rail	None identified	
Foss Creek	68.7	Healdsburg	Bridge Crossing	temperature	Russian River
Russian River	67.6	Healdsburg	Major Bridge Crossing	Sedimentation/ Siltation/ Temperature	Russian River
Unnamed Stream	66.3	S Healdsburg	Culvert crossing	None identified	Russian River
Unnamed Stream	65.3	Sotoyome	Culvert crossing	None identified	Russian River
Unnamed Stream	64.7	S. Sotoyome	Bridge Crossing	None identified	Russian River
Windsor Creek	62.4	Windsor	Bridge Crossing	Temperature	Russian River
Pool Creek	61.3	Shiloh (Windsor)	Bridge Crossing	Temperature	Russian
Mark West Creek	59.5	Mark West	Bridge Crossing	Temperature	Russian
Piner Creek	56.1	Fulton (Santa Rosa)	Bridge Crossing	Temperature	Santa Rosa Creek
Paulen Creek	55.9	Santa Rosa	Bridge Crossing	Temperature	Santa Rosa Creek
Santa Rosa Creek	53.6	Santa Rosa	Bridge Crossing	Temperature	Laguna de Santa Rosa
Colgan Creek	52.3	Santa Rosa	Flood Control Channel	Temperature	Russian River
Laguna de Santa Rosa	49.1	S. Cotati	Bridge Crossing	DO/Nitrogen/Sedimentation/	Russian River

Waterbody Name	Approximate Mile Post	Nearest Community	Proximity to Proposed Project Corridor	Priority Pollutant 303(D) List	Tributary
				Temperature	
Hinebaugh Creek	47.5	Rohnert Park	Bridge Crossing	None identified	Laguna de Santa Rosa
Copeland Creek	47.0	Rohnert Park	Bridge Crossing	None Identified	Laguna de Santa Rosa
Lichau Creek	44.4	Penngrove	Bridge Crossing	None identified	Petaluma River
Willow Brook Creek	42.4	Denman Flat	Culvert crossing	Temperature	Petaluma River
Unnamed Stream	40.8	Crown	Culvert crossing	None identified	Petaluma River
Petaluma River	39.7	N. Petaluma	Bridge Crossing	Sedimentation	San Pablo Bay
Petaluma River	38.9	N. Petaluma	Bridge Crossing	Sedimentation/ Siltation/ Nutrients/ Pathogens/Metals	San Pablo Bay
Petaluma River	37.2	McNear (Petaluma)	Major Bridge Crossing	Sedimentation / Siltation/ Nutrients/ Pathogens/Metals	San Pablo Bay
Schultz Slough	34.2	Neils Island	Bridge Crossing	Siltation/Temperature	Petaluma River
San Antonio Creek	33.5	Burdell	Creek runs adjacent to tracks.	Diazinon	Petaluma River
Mud Slough	32.6	Burdell	Slough adjacent to tracks	None identified	Petaluma River
Basalt Creek	29.7	N. Novato	Creek runs adjacent to tracks	None identified	Petaluma River
Petaluma Marsh	29.0 – 29.5	Novato	Jurisdictional Wetlands	None identified	Petaluma River
Novato Creek	26.9	Novato	Major Bridge Crossing	Diazinon	San Pablo Bay
Petaluma Marsh	26.0	Novato	Bridge Crossing	None identified	San Pablo Bay
Arroyo de San Jose	24.8	Ignacio	Bridge Crossing	None identified	San Pablo Bay
Pacheco Creek	24.0	Marin Keys	Culvert crossing	None identified	San Francisco Bay
Miller Creek	22.1	St. Vincent	Bridge Crossing	Diazinon	San Francisco Bay
Gallinas Creek	20.9	Las Gallinas	Bridge Crossing	Diazinon	San Francisco Bay
S.F. Gallinas Creek	19.8 – 20.4	Las Gallinas	Creek runs adjacent to tracks	None identified	San Francisco Bay
Rush Creek	19.9	Novato	Creek runs adjacent to tracks	None identified	Petaluma River
Mahon Creek	16.9	San Rafael	Culvert crossing	None identified	San Francisco Bay
Corte Madera Creek	14.6	San Rafael	Culvert crossing	Diazinon	San Francisco Bay

Source: Winzler & Kelly Consulting Engineers, April 2004 and USEPA 2002 CWA Section 303(d) List Of Water Quality Limited Segments. Only streams that are shown on USGS 7.5 minute topographic maps are evaluated in the CWA Section 303(d) report and listed in the table.

FIGURE 3.3-1
100-YEAR FLOOD HAZARD ZONE



Source: Dyett & Bhatia, *Transportation 2030 Plan: Draft Environmental Impact Report*, October 2004.

Groundwater

The project site is within the North Coast and San Francisco Bay HR. The North Coast HR covers approximately 12.46 million acres (19,470 square miles) and includes all or portions of Modoc, Siskiyou, Del Norte, Trinity, Humboldt, Mendocino, Lake, and Sonoma counties. Small areas of Shasta, Tehama, Glenn, Colusa, and Marin counties are also within the region. The North Coast HR corresponds to the boundary of RWQCB 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. The region corresponds to the boundary of RWQCB Region 2.

Groundwater development in the North Coast HR occurs along the coast, near the mouths of some of the region's major rivers, on the adjacent narrow marine terraces, or in the inland river valleys and basins. Reliability of these supplies varies significantly from area to area. There are 63 groundwater basins/subbasins delineated in the region, two of which are shared with Oregon.

The San Francisco Bay HR has 28 identified groundwater basins. One of those, the Napa-Sonoma Valley groundwater basin is further divided into three subbasins: Napa Valley, Sonoma Valley and Napa-Sonoma Lowlands.

Despite the tremendous urban development in the San Francisco Bay HR, groundwater use accounts for only about five percent (68,000 acre-feet) of the region's estimated average water supply for agricultural and urban uses, and accounts for less than one percent of statewide groundwater uses.

In general, groundwater quality throughout most of both regions is suitable for most urban and agricultural uses with only local impairments. The primary constituents of concern are high Total Dissolved Solids (TDS), nitrate, boron, and organic compounds. The areas of high TDS (and chloride) concentrations are typically found in the region's groundwater basins that are situated close to the San Francisco Bay, such as southern Sonoma, Petaluma and Napa valleys. Iron, boron and manganese are also problematic for the inland basins within Sonoma County. Depth to groundwater varies considerably within the proposed project corridor due to differing soil types and geological features. Groundwater can be defined as the part of the subsurface water that is in the zone of saturation. Well data was obtained and provided by the California Department of Water Resources. Depth to groundwater data, broken down by city along the proposed project corridor, is presented in Table 3.3-2.

TABLE 3.3-2
DEPTH TO GROUNDWATER (SELECTED LOCATIONS)

Community	Groundwater Range Below Ground Surface (BGS)
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
San Rafael	3.34 feet to 6.16 feet
Greenbrae	1.59 feet to 4.73 feet

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

3.3.3 Significance Criteria

Project-related effects on hydrology and water quality were considered significant when these impacts would result in the following conditions:

- 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 or planned uses for which permits have been granted);
- 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;
- 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; or
- 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.

3.3.4 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 Department of Water Resources, 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).

3.3.5 Impact Summary

Because the proposed project would disturb an area exceeding one acre in size, it would be subject to NPDES permit requirements. NPDES permit conformance requires that the project applicant file a Notice of Intent (NOI) and prepare a Storm Water Pollution Prevention Plan (SWPPP) to the RWQCB. The SWPPP contains a listing and implementation plan for the stormwater Best Management Practices (BMPs) that would be implemented during construction of the proposed project to minimize erosion, sedimentation, and water contamination, as well as permanent post-construction BMPs. Following the NPDES permit, conformance requirements would reduce any water quality, erosion or sedimentation impacts associated with discharge or run-off to a less than significant level.

The proposed project includes approximately 125 acres of new paved areas, spread over a distance of 70 miles. This includes approximately 100 acres of proposed bicycle/pedestrian pathway and 25 acres of parking within the proposed stations and maintenance facilities. These new impermeable areas would likely lead to a slight increase in stormwater runoff from the proposed project area. In addition, potential pollutants such as oil, grease, detergents, chemicals, metals, and solid materials, could pass

into the drainage system. Water quality impacts would be minimized through implementation of BMPs during construction and development of proper drainage and stormwater collection facilities.

The proposed project would not result in the extended extraction of groundwater and would therefore not have long-term impacts on groundwater supplies or the production rates of wells in the vicinity of the proposed project. During construction, excavations may encounter shallow or perched groundwater, which may require dewatering. Dewatering of sandy soils can cause ground settlement and damage to structures and underground utilities. These impacts and their mitigation are discussed in Section 3.2, Geology, Soils and Seismicity. Because the proposed project would not have long-term or permanent impacts on the groundwater system, no further analysis is required in the following impact discussion.

Implementation of the regulatory, permitting and mitigation requirements outlined in this section would reduce impacts on hydrology and water quality to levels that are less than significant.

3.3.6 Impacts and Mitigation Measures

Construction-Related Impacts

Hydrology

Impact WR-1: Project construction could cause a temporary increase in surface erosion, sedimentation and stream alterations due to the use of earthmoving equipment. *(Significant mitigable)*

During construction of the proposed rail stations and the bicycle/pedestrian pathway, land would be cleared and graded. In general, the disturbance associated with construction would be temporary and the disturbed ground surface would be paved, in the case of proposed station parking areas and the proposed bicycle/pedestrian pathway. As described in Section 2.9 (Environmental Compliance Measures), in order to minimize the physical effects at water crossings the small and medium size railroad bridges would be repaired in place, and reconstruction of larger bridges would be conducted within the original footprint. Nevertheless, exposure of surface soils during construction activities could lead to increased surface runoff and erosion. In areas adjacent to streams increased erosion could lead to increased stream sedimentation. The project description (Chapter 2) includes incorporation of BMPs to reduce erosion, sedimentation and stream alteration. In addition, the following mitigation measure would ensure that impacts are not significant.

> **Mitigation Measure WR-1a:** The proposed project shall comply with the NPDES permit process which requires project applicants to file a Notice of Intent (NOI) and prepare and submit a SWPPP to the RWQCB. The SWPPP must contain a detailed mitigation plan for erosion and sediment control, including plans for implementing BMPs for the control of stormwater runoff, erosion and sedimentation. 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 Measure WR-1b:** The proposed project shall comply with the requirements for a Streambed Alteration Agreement for those portions of the project that would be completed along the banks of various surface waterbodies.

Impact WR-2: Adverse impacts on surface waters could occur from the release of hydrocarbons and similar pollutants during construction activities. *(Less than significant)*

Construction equipment and vehicles operating in close proximity to surface waterbodies could result in accidental discharges of oil or other construction-related contaminants into streams. Accidental spills from refueling and lubrication would be avoided by implementing a spill prevention program, which is listed in the project description as an environmental compliance measure (Section 2.9). Such programs generally include exclusion zones adjacent to streams and other bodies of water, and

specific procedures for spill containment and cleanup in the event of an accident. Spill prevention programs also establish protocols for oversight and inspection of construction activities to assure compliance with the plan. Therefore, the potential impact related to release of pollutants is less than significant.

Long-Term Impacts

Hydrology and Stormwater Runoff

Impact WR-3: The proposed project would have the potential to improve water quality and stormwater management and re-establish hydrologic zones along the project right-of-way. *(Beneficial)*

There would be no permanent alterations of terrain that would affect watershed hydrology. The proposed project would have a negligible impact on peak flow rates or flood volumes. Instead, the proposed project would involve re-construction of drainage facilities to improve hydrologic conditions. Over the years, many of the cross-culverts along this inactive rail corridor have become clogged with debris, which has caused erosion of surface and side slopes. As part of the proposed project, cross-culverts would be cleared, resized, or reconstructed, as necessary, to re-establish hydrologic connections and minimize sediment delivery to the waterbodies listed in Table 3.3-1. These measures also would reduce the risk of flooding that can occur when surface water ponds behind clogged culverts.

Impact WR-4: The proposed project may cause an increase in runoff of pollutants from parking lots and the proposed rail maintenance facility. *(Less than significant)*

The increased area of impervious surfaces covered by parking lots, sidewalks and buildings could result in increased surface water runoff from storms. Process water and runoff from the proposed maintenance and storage facilities and station parking lots could contain a number of pollutants that could be released into stormwater systems. Process water such as steam cleaning, vehicle washing and floor wash-downs typically contain concentrations of oil and grease, detergents, chemicals, metals, and solid materials that could pass into the drainage system. Operation of private vehicles and buses could result in the deposition of oil and grease on surface parking lots that could subsequently be carried into the surface water systems with stormwater runoff. These materials would impact surface water quality but should have a negligible affect on drinking water supplies. None of the proposed parking lots or maintenance and storage facilities would be located in close proximity to drinking water intakes.

The proposed project includes provisions to contain runoff. Surface runoff from the rail improvements, station construction, the maintenance facilities, and park-and-ride facilities would be intercepted with bio-filtration swales or other appropriate containment devices. Surface water runoff from these areas would be dispersed in accordance with the measures required under a SWPPP from the RWQCB. With these measures in place, potential impacts would be negligible.

Floodplain

Impact WR-5: Placement of new structures or fill material within a designated 100-year floodplain could increase flooding upstream of the structures. *(Significant mitigable)*

According to guidelines established by FEMA, increase in flood height in the floodway due to any encroachment in the floodway fringe areas may not exceed 12 inches, provided that hazardous velocities are not produced in the waterbody. Constructing bridges, levees, rail and road embankments, buildings, etc., that encroach on floodplains may reduce the flood-carrying capacity and increase flood elevations. For the proposed project, the primary floodplain impacts would occur at rail stations. Table 3.3-3 presents a listing of proposed new rail stations to be constructed. As shown in Table 3.3-3, five of the proposed stations would be located within the 100-year floodplain and could affect flooding up stream of the proposed station. The risk of a substantial increase in flooding due to new structures would be minimal at most stations since the proposed structures would be relatively small. Replacement or rehabilitation of existing structures such as bridges would be done within the original footprint, thereby

avoiding impacts on the floodplain. In situations where existing culverts are not adequately sized and need to be replaced, the larger replacement structures would reduce flooding risk.

> **Mitigation Measure WR-2:** Design structures and other improvements on the site so as not to raise flood levels. Specific measures shall be based on site specific hydrologic studies conducted during the final design stage of the proposed project. Once these studies have been completed, specific elements can be designed to eliminate impacts. When feasible, construction within the floodplain shall be avoided or minimized. When construction within the floodplain is unavoidable, efforts will be made to restore the floodplain, as necessary, to restore flood capacity.

Cumulative Impacts

The cumulative impact of changing land uses, from rural to suburban, and accompanying increases in population has modified the quantity, timing and quality of surface water runoff. Urban and suburban runoff typically contains higher concentrations of nutrients (e.g., nitrogen and phosphorus), oxygen consuming wastes, pathogens, pesticides, heavy metals, and oil, compared with runoff from rural areas.

The original construction of Highway 101 and subsequent land use changes (e.g., agriculture to residential) and population increases along the transportation corridor have adversely impacted basin water quality. For example, access roads and driveways in large lot subdivisions along Highway 101 comprise one-half to three-quarters of the impervious surface area surrounding this transportation corridor.

Many major residential developments are planned for the Highway 101 corridor that generally follows the course of the project right-of-way. These planned developments could contribute to the cumulative degradation of water quality in the Russian River basin and the San Francisco Bay HR.

Recognizing the importance of water quality and quantity, it is expected that federal/state regulations and guidelines, including BMPs on stormwater management and runoff, would minimize the cumulative impacts of water resources in the proposed project area. Waterbody impairments in the subject area are largely due to agricultural practices and urban runoff and are not considered cumulatively significant. The limited amount of impervious surfaces and associated runoff added by the proposed project would not represent a considerable contribution to cumulative impacts. Therefore, there is not a significant cumulative impact on hydrology and water quality.

TABLE 3.3-3
POTENTIAL FLOOD IMPACTS ON PROPOSED NEW STATIONS

SMART Station Name	Existing Structure (track elevation)	Proposed Structure	FEMA FIRM Panel Map	Flood Zone	Comments
Healdsburg	106’	Station	City of Healdsburg panel 060378-0005	In Zone C (Area of minimal flooding - no shading)	No potential for flooding
Windsor	117’	Station	Sonoma County panel 060375-0540	In Zone X (area determined to be outside 500-year floodplain)	No potential for flooding
Corona Road	36’	Station	Sonoma County panel 060375-0870	In Zone AH, 100-year flood elevation of 32 feet (area of 100-year flooding where depths are between one foot and three feet; base flood elevations are shown but no flood hazard factors are determined)	Station improvements will create impacts on the 100-year flood elevation. MM WR-2 required.
North Novato	10’	Station	City of Novato panel 060178-0002	In a detailed 100-year flood plain Zone AE with a 100-year flood elevation of 7 feet	MM WR-2 required.
Civic Center	12’	Station	City of San Rafael panel 065058-0005	Edge of Zone B (areas between limits of 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one foot)	MM WR-2 required.
Downtown San Rafael	12’	Station	City of San Rafael panel 065058-0015	In Zone B (areas between limits of 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one foot)	MM WR-2 required.
Larkspur	32’	Station	City of Larkspur panel 065040-0001	In Zone B (areas between limits of 100-year flood and 500-year flood; or certain areas subject to 100-year flooding with average depths less than one foot)	MM WR-2 required.

Source: Winzler & Kelly Consulting Engineers, April 2004.