Section 3.2

Hydrology and Water Quality

Introduction

This assessment was limited to a qualitative evaluation of environmental impacts with respect to hydrology and water quality. The assessment did not include site-specific data review, laboratory analysis, or inspection of potential project sites. A more detailed hydrology and water quality impact analysis would be required during development of proposed individual roadway improvement projects.

Environmental Setting

General Climate

Carmel Valley is on the central California coast, immediately adjacent to the Pacific Ocean. The climate in this region consists of generally mild temperatures year-round, with high temperatures varying from the low 60s in the winter to the high 60s in the summer. Average annual precipitation is 18 to 20 inches, and the majority of rainfall occurs in winter.

Hydrology

Regional Hydrology

The proposed program is within the Carmel River Watershed in the northern portion of the Central Coast hydrological region, which spans the coastal portion of California from the northern reaches of Monterey Bay in the north to the Santa Barbara Channel Islands and adjacent coast in the south. The primary water features of the watershed's northern portion include the Pacific Ocean and the coastline of the Monterey Peninsula, small inland drainage basins of the Peninsula, the Carmel River, and Carmel Bay. The Carmel River originates in the Santa Lucia Range of the Coast Mountains and flows through the northwest-southeast trending Carmel Valley, with the river flowing toward the northwest

and draining into the Carmel Bay, which is situated opposite the Monterey Bay, south of the Monterey Peninsula.

Carmel Valley Hydrology

Surface Hydrology

The Carmel Valley Basin drains a 250-square-mile area that includes all of the Carmel Valley. Minor creeks and drainages generally lead to the Carmel River, which carries almost all of the area's drainage to the Carmel Bay. Precipitation provides the only source of water for the basin. Generally, the Carmel River flows naturally only during the winter and spring months, because the basin receives the majority of its annual rainfall between November and April. Rainfall averages between 15 to over 40 inches per year. Seasonal precipitation patterns are further complicated by the fact that demand in the watershed exceeds the available supply.

Dry season releases from the San Clemente and Los Padres Reservoirs, both upstream (southeast) of the proposed traffic improvement projects area, and the Carmel River, are timed to recharge the Carmel Valley Aquifer and to provide adequate flow for steelhead trout spawning, when necessary. Seasonal flow in the Carmel River is an important component of regional steelhead reproduction, as has historically supported a run of the federally listed species.

Groundwater Hydrology

The proposed program area is underlain by the Carmel Valley Aquifer, a highly permeable, unconfined alluvial aquifer present beneath the bed, floodplain, and terraces of the Carmel River. The aquifer extends from San Clemente Dam to the Carmel River Lagoon at the Pacific Ocean. Similar to flows in the river itself, groundwater levels in the aquifer are dependent on seasonal rain and are supplemented by releases from the nearby reservoirs, when necessary. The aquifer recharges rapidly after storm events following extended dry periods. Approximately 85 percent of the recharge in the aquifer occurs through the Carmel Riverbed, with additional water coming from tributary drainages, precipitation, inflow from surface bedrock, and return flow from irrigation systems and septic tanks. The Carmel Valley Aquifer system functions as a water supply source for a large portion of the local area.

Flooding

Major flood events have occurred in Monterey County during the flowing years: 1911, 1914, 1922, 1926, 1931, 1937, 1938, 1941, 1943, 1945, 1952, 1955, 1956, 1958, 1962, 1966, 1969, 1973, 1978, 1983, 1995, and 1998 (Monterey County Water Resources Agency 2003). Flooding has occurred along the Carmel River on multiple occasions. Some private levees have been constructed along the

Carmel River downstream of the program area, although they are not adequate to hold the 100-year flood (Federal Emergency Management Agency 1991). Prior to 1991, newspaper reports of flooding along the Carmel River included reports that were made in 1941 (Jamesburg Road flooded in the upper Carmel Valley), in 1943 (8,000 cubic feet per second [cfs] was spilling over San Clemente Dam), and in 1958 (numerous homes along the Carmel River were flooded) (Federal Emergency Management Agency 1991).

In more recent history, two flooding events occurred along the Carmel River in January and March of 1995. During the March event, flooding in the Carmel Valley damaged 400 residences and 68 businesses, the Highway 1 Bridge over the Carmel River was closed, and untreated sewage was released into the Carmel River (Monterey County Water Resources Agency 2003).

At the USGS gage near the City of Carmel, the 100-year flow has been estimated to be 29,100 cfs. Monterey County enforces flood control standards within 100-year flood hazard areas in accord with National Flood Insurance Program (NFIP) requirements, as discussed in more detail below (see Regulatory Setting).

Water Quality

Surface Water Quality

Surface water quality depends primarily on the mineral composition of the soils and associated parent materials within a watershed, hydrologic conditions, and sources and timing of contaminant transport within the watershed. During the summer low-flow conditions, natural watercourses may consist entirely of incidental urban runoff from landscape irrigation and other residential uses. Contaminants of concern during the summer include fertilizers and pesticides, detergents and other household chemical uses; oil and grease; and accidental or illicit chemical spills. Contaminants of concern during the dry summer season include biostimulatory nutrients (e.g., nitrogen and phosphorus), inorganic salts, turbidity, synthetic organic compounds, and trace metals.

During peak winter streamflow periods, water quality is largely a function of stormwater contaminant transport. Potential contaminants include those described above, and can also include runoff from roads and other impervious surfaces (e.g., parking lots, driveways, buildings), and other deposits that have accumulated on the ground surface (e.g., organic litter, trash, animal wastes). Winter stormwater is also responsible for a majority of soil erosion that occurs during the year, particularly from areas that have been previously disturbed by construction activities, agriculture, or natural geologic processes.

Winter stormwater runoff often is relatively clean, and low in dissolved solids due to the large proportion of rainwater; however, dissolved solids loading is likely higher in the wet season. Runoff from urban areas can contain elevated concentrations of heavy metals, oil and grease, antifreeze, and other synthetic organic compounds. Other contaminants of concern include turbidity, settleable

and total suspended solids, biochemical oxygen demand, pesticides, and nutrients.

The Carmel River is not listed by the State as an impaired water body pursuant to the CWA Section 303(d) (see discussion below). Water quality in the Carmel River has been measured by the Monterey Peninsula Water Management District (MPWMD) since 1991. Sampling has primarily occurred at two locations, below Los Padres Dam and below San Clemente Dam. The following water quality constituents are typically measured: temperature (degrees Fahrenheit [ºF]), dissolved oxygen (milligrams per liter [mg/L]), pH, carbon dioxide (mg/L), specific conductance (microSiemens per centimeter [µS/cm]), and turbidity (nephelometric turbidity units [NTU]) (Monterey Peninsula Water Management District 2004).

Water temperature data have been collected at six additional locations along the Carmel River since 1996. In general, water temperatures in the river are within the desirable range for aquatic species in the winter and spring months. Lower temperatures are found during these seasons due to larger and cooler river inflows. As flows drop and the water warms, temperatures often exceed the recommended range for aquatic species during the summer and fall months. For example, maximum measured daily water temperatures can exceed 70º F in the main stem, which is considerably higher than the optimal 50º F to 60º F range identified for steelhead growth. All six water temperature monitoring stations indicate stressful temperature conditions during the summer and fall seasons (Monterey Peninsula Water Management District 2004).

Dissolved oxygen values measured on the Carmel River generally meet or exceed 7 mg/L, while measured pH values uniformly fall between 7 and 8.5. Measured carbon dioxide values occasionally rise above the 10 mg/L upper limit recommended for fish. Measured specific conductance has ranged from 129 to 550 µS/cm, with an average of 267 uS/cm over the sampling period (Monterey Peninsula Water Management District 2004).

Measured turbidity in Carmel River is typically very low. Increases in turbidity have been observed during large winter storm events and for several months after large-scale landslide and bank erosion activity within the watershed. Turbidity levels also appear to have increased after water levels in San Clemente Reservoir were lowered in June 2003, releasing a large amount of previously trapped sediment. It is unclear how long turbidity levels in the Carmel River will remain elevated from this event, as monitoring data are only available through August 2004 (Monterey Peninsula Water Management District 2004).

Chemical pollutants do not appear to be a substantial concern; however, the *Physical and Hydrological Assessment of the Carmel River Watershed* (The Watershed Institute, November 2004) identified several factors that presently affect water quality in the region. These include a demand that exceeds the available supply, leading to enhanced drought conditions in the surface water and groundwater resources; urbanization in the floodplain; and generation of excess sedimentation from such sources as excessive travel on dirt roads, undersized drainage culverts, and incised tributary streams with tall, eroding banks. In the

past, groundwater quality has also been affected by seepage from septic systems, which are used extensively throughout the region.

Regulatory Setting

This section discusses the federal, state and local policies and regulations that are relevant to the analysis of hydrology and water quality in the program area.

Federal Policies and Regulations

Clean Water Act

The State Water Resources Control Board (State Water Board) is the state agency with primary responsibility for implementation of state and federally established regulations relating to water resource issues. Typically, all regulatory requirements are implemented by the State Water Board through regional boards established throughout the state. The Central Coast RWQCB is the agency responsible for regulating discharges in the Carmel River Valley.

The CWA is the primary federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. It operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit; permit review is the CWA's primary regulatory tool.

Section 303

The State adopts water quality standards to protect beneficial uses of state waters as required by Section 303 of the CWA and the Porter-Cologne Act. Section 303(d) of the CWA established the total maximum daily load (TMDL) process to guide the application of state water quality standards (see discussion of state water quality standards below). To identify candidate water bodies for TMDL analysis, a list of water quality–limited streams was generated. These streams are impaired by the presence of pollutants, including sediment, and are more sensitive to disturbance. No drainages in or immediately adjacent to the program area are 303(d) listed, including the Carmel River.

Section 401

Section 401 of the CWA requires that an applicant pursuing a federal permit to conduct any activity that may result in a discharge of a pollutant obtain a Water Quality Certification (or waiver). Water Quality Certifications are issued by RWQCBs in California. Under the CWA, the state (RWQCB) must issue or waive Section 401 Water Quality Certification for the project to be permitted

under Section 404. Water Quality Certification requires the evaluation of water quality considerations associated with dredging or placement of fill materials into waters of the United States and imposes project-specific conditions on development. A Section 401 waiver establishes standard conditions that apply to any project that qualifies for a waiver.

Section 402

Section 402 of the CWA regulates discharges to surface waters through the NPDES program, administered by the EPA. In California, the State Water Board is authorized by the EPA to oversee the NPDES program through the RWQCBs (see related discussion under "Porter-Cologne Water Quality Control Act"). The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits.

Section 404

Section 404 of the CWA regulates the discharge of dredged and fill materials into "waters of the United States," which include oceans, bays, rivers, streams, lakes, ponds, and wetlands. The County must obtain a permit from the U.S. Army Corps of Engineers (Corps) for all discharges of dredged or fill material into waters of the United States, including wetlands, before proceeding with a proposed activity. Before any actions that may impact surface waters are carried out, a delineation of jurisdictional waters of the United States must be completed, following Corps protocols in order to determine whether the program area encompasses wetlands or other waters of the United States that qualify for CWA protection. These include any or all of the following:

- Areas within the ordinary high water mark of a stream, including non-perennial streams with a defined bed and bank and any stream channel that conveys natural runoff, even if it has been realigned.
- Seasonal and perennial wetlands, including coastal wetlands.

Wetlands are defined for regulatory purposes as areas "inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions" (33 CFR 328.3, 40 CFR 230.3).

Section 404 permits may be issued only for the least environmentally damaging practicable alternative. That is, authorization of a proposed discharge is prohibited if there is a practicable alternative that would have less adverse impacts and lacks other significant adverse consequences. If the proposed traffic improvement projects activities were to involve dumping any fill material, then this permit would be applicable.

Development on Floodplains

Federal Flood Insurance Program

Alarmed by increasing costs of disaster relief, Congress passed the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973. The intent of these acts was to reduce the need for large, publicly funded flood control structures and disaster relief by restricting development on floodplains.

FEMA administers the National Flood Insurance Program to provide subsidized flood insurance to communities that comply with FEMA regulations limiting development in floodplains. FEMA issues flood insurance rate maps for communities participating in the National Flood Insurance Program. These maps delineate flood hazard zones in the community.

Executive Order 11988

Executive Order 11988 (Floodplain Management) addresses floodplain issues related to public safety, conservation, and economics. It generally requires federal agencies constructing, permitting, or funding to:

- avoid incompatible floodplain development.
- be consistent with the standards and criteria of the National Flood Insurance Program.
- restore and preserve natural and beneficial floodplain values.

State Policies and Regulations

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act, passed in 1969, articulates with the CWA (see the *Clean Water Act* section above). It establishes the State Water Board and divides the state into nine regions, each overseen by a RWQCB. The State Water Board is the primary state agency responsible for protecting the quality of the state's surface and groundwater supplies, but much of its daily implementation authority is delegated to the nine RWQCBs, which are responsible for implementing CWA Sections 401, 402, and 303(d). In general, the State Water Board manages both water rights and statewide regulation of water quality, while the RWQCBs focus exclusively on water quality within their regions.

Central Coast Regional Water Quality Control Board

The Central Coast RWQCB is responsible for the protection of beneficial uses of water resources in the Central Coast region. The RWQCB uses planning,

permitting, and enforcement authorities to meet this responsibility and has adopted the Water Quality Control Plan for the Central Coast Region (Basin Plan) (Central Coast Regional Water Quality Control Board 1994) to implement plans, policies, and provisions for water quality management in the region. Beneficial uses of surface waters are identified for major surface waters and their tributaries and described in the Basin Plan. In addition, the Basin Plan identifies water quality objectives and implementation plans for the protection of the beneficial uses of the basin.

Beneficial Uses and Water Quality Objectives

Beneficial uses are the resources, services, and qualities of the aquatic system that are the ultimate goals of protecting and achieving high water quality. The following beneficial uses have been identified for the Carmel River: municipal and domestic supply; agricultural supply; industrial service supply; groundwater recharge; contact and non-contact water recreation; warm freshwater habitat; cold freshwater habitat; wildlife habitat; migration of aquatic organisms; spawning, reproduction, and early development of fish; preservation of biological habitats of special significance; rare, threatened, or endangered species habitat; freshwater replenishment; and commercial and sport fishing. The RWQCB has set water quality objectives for all surface waters in the basin concerning color, tastes, and odors; floating, suspended, and settleable material; oil and grease; biostimulatory substances; sediment; turbidity; pH; dissolved oxygen; temperature; toxicity; pesticides; organic substances; and radioactivity. Also, specific objectives for concentrations of chemical constituents are applied to bodies of water based on their designated beneficial uses, including municipal and domestic supply, contact and noncontact water recreation, warm freshwater habitat, and fish spawning. For instance, for those water bodies identified for municipal and domestic supply, additional regulations apply regarding pH, organic chemicals, chemical constituents, phenol, and radioactivity.

Construction Activity Permitting

The RWQCB administers the NPDES stormwater permitting program for construction and industrial activities in the Central Coast region. Construction activities disturbing 1 or more acres of land are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (General Construction Permit). For qualifying projects, the project applicant must submit, before construction begins, a Notice of Intent (NOI) to the RWQCB to be covered by the General Construction Permit. The General Construction Permit requires the preparation and implementation of a SWPPP, which also must be completed before construction begins. Implementation of the plan starts with the commencement of construction and continues though the completion of the project. Upon completion of the project, the applicant must submit a Notice of Termination to the RWQCB to indicate that construction is complete.

Permitting for Dewatering Activities

Under the NPDES program, the RWQCB has also adopted a General Permit for Discharges with Low Threat to Water Quality (General Low Threat Permit). This permit applies to various categories of activities, and would be likely to apply to the proposed traffic improvement projects if the applicant conducted dewatering activities during construction and discharged the effluent to surface water or groundwater. This permit contains waste discharge and effluent limitations similar to those in the General Construction and General Industrial Permits. To obtain coverage, the applicant must submit an NOI and data establishing the chemical characteristics of the dewatering discharge. A standard monitoring and reporting program is included as part of the permit. For dewatering activities that are not covered by the General Permit, an individual NPDES permit and WDRs must be obtained from the RWQCB.

The General Dewatering Permit would be applicable to the proposed traffic improvement projects if there would be any excavation below the water table where dewatering activities would take place.

MS4 Permits

Under the CWA, urban areas with municipal separate storm sewer systems (MS4s) are required to obtain an NPDES permit. The RWQCB administers the NPDES stormwater permitting program for MS4s. MS4s are categorized as either large or small. Cities with populations greater than 100,000 are considered to have large MS4 systems and are required to get permits under Phase I of the EPA's stormwater program. Other urban areas (areas with greater than 1,000 residents per square mile or areas with high growth potential) are considered to have small MS4s and are required to get permits under Phase II of the EPA's stormwater program.

To obtain an MS4 permit, it is necessary for operators of small MS4s to create a stormwater management program (SWMP). The Cities of Monterey, Sand City, Del Rey Oaks, Marina, Seaside, and Pacific Grove and the County of Monterey submitted a revised SWMP to the RWQCB in June 2006. On September 8, 2006 the SWMP was accepted by the RWQCB with the provision that certain modifications be made (Regional Water Quality Control Board 2006a). The SWMP includes unincorporated urban areas of Monterey County. The Rancho Canada project is located within Monterey County urbanized area C (Regional Water Quality Control Board 2006b) and would be subject to following the SWMP guidelines.

Section 1600–1607 of the California Fish and Game Code

California Department of Fish and Game (DFG) is authorized, under Sections 1600–1607 of the California Fish and Game Code, to develop mitigation measures and enter into streambed alteration agreements with applicants who propose projects that would obstruct the flow or alter the bed, channel, or bank of a river or stream in which there is a fish or wildlife resource, including intermittent and ephemeral streams.

Local Policies and Regulations

Monterey County General Plan

Objectives and policies defined in the Monterey County General Plan that are relevant to the proposed program are summarized below.

Objective 5.2: Preserve vegetation where necessary to protect waterways from bank erosion and siltation.

Policy 5.2.1: Owners of property adjacent to waterways or responsible agencies shall be encouraged to maintain healthy vegetation along the drainage course, or provide other suitable means of preventing bank erosion or siltation.

Policy 5.2.2: The County shall establish special procedures for land use, building locations, grading operations, and vegetation removal adjacent to all waterways and significant water features.

Objective 16.2: Reduce the risk from flooding and erosion to an acceptable level by regulating the location, type, and density of land use.

Objective 21.1: Enhance the quality of water in the County by regulating the type, location, and intensity of land use, and grading operations.

Greater Monterey Peninsula Area Plan

The Greater Monterey Peninsula Area Plan is a subset of the Monterey County General Plan, and covers one of eight subareas within Monterey County. The Greater Monterey Peninsula Area Plan does not contain any additional policies or language pertinent to the hydrological or water quality-related aspects of the roadway improvement projects beyond those specified in the Monterey County General Plan.

Carmel Valley Master Plan

The Carmel Valley Master Plan is part of the Monterey County General Plan. The policies outlined in the Carmel Valley Master Plan and summarized below must be considered in conjunction with the Monterey County General Plan.

Policy 6.1.3 (CV): All beneficial uses of the total water resources of the Carmel River and its tributaries shall be considered and provided for in future planning decisions.

Policy 35.1.3 (CV): Storm drainage facilities shall be designed to accommodate runoff from the 10-year or 100-year storms as recommended by the Monterey County Flood Control and Water Conservation District.

Carmel Valley Floodplain Ordinance

Regulations for floodplains in Monterey County are contained in Chapter 16.16 of Monterey County Code. The Carmel Valley Flood Plain Ordinance (Chapter 21.64) includes additional floodplain regulations for land use within the Carmel Valley floodplain. For development within the 100-year floodplain or within 200 feet of the riverbank, a Use Permit from the Monterey County Resource Management Agency - Planning Department may be required.

As defined in County Code, development means 'any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation, or drilling operations'. There are more restrictive regulations for development within the FEMA-defined floodway.

Monterey Peninsula Water Management District

The MPWMD is a public agency that was created in 1978 by State statute to oversee water usage and protection in the region. The MPWMD coordinates among local water districts, jurisdictions, and agencies to allocate water and ensure necessary conservation. They monitor hydrologic conditions and available resources, issue connection permits, and oversee fish, riparian, and lagoon mitigation programs along the Carmel River and other area resources.

Criteria for Determining Significance

In accordance with State CEQA Guidelines, federal and state regulations and applicable local plans and policies, a project impact would be considered significant under the following conditions:

A. Alteration of Drainage Patterns

Substantially alter the existing drainage pattern of the project sites or area, or result in offsite drainage or flood problems.

B. Stormwater Runoff and Drainage Infrastructure

Substantially increase the rate or amount of surface runoff, which would exceed capacity of existing or planned storm drain facilities, cause downstream or offsite drainage problems, or increase the risk or severity of flooding in downstream areas.

C. Water Quality

Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface water quality or contribute substantial non-point sources of pollution to the Carmel Bay Water Quality Protection Area.

D. Groundwater Supply

Substantially deplete groundwater supplies or substantially interfere with groundwater recharge.

E. Risk of Flooding

Result in construction of habitable structures within a 100-year floodplain, which would expose people or structures to a significant risk of loss, injury, or death due to flooding.

Expose people or structures to a significant risk of loss, injury, or death involving flooding.

F. Risk of Inundation by Seiche, Tsunami, or Mudflow

Increase the likelihood of inundation by seiche, tsunami, or mudflow.

Impacts and Mitigation Measures

A. Alteration of Drainage Patterns

Impact H-1: Potential Alteration of Drainage Patterns (Less than Significant)

The proposed roadway improvements are not expected to substantially alter existing drainage patterns. Grades within specific project areas would be restored to pre-project conditions to the extent practicable. In addition, any required roadway stormwater management system would be designed to mimic existing drainage patterns to the extent practicable. Therefore, this impact is considered **less-than-significant**. No mitigation is required.

B. Stormwater Runoff and Drainage Infrastructure

Impact H-2: Potential Increases in Runoff or Exceedances in Stormwater Capacity (Less than Significant with Mitigation)

The increase in impervious surfaces associated with construction of passing lanes, turning lanes, widened shoulders, paved turn outs, and/or new roadways (i.e., Laureles Grade/Carmel Valley Road grade separation) is expected to increase runoff in peak flows and volumes compared to existing conditions. If post-construction flows are not controlled, scouring of local creek channels and localized flooding of areas where specific improvements would be located could occur. This impact is considered potentially significant. Implementation of **Mitigation Measure H-2.1** would reduce this impact to a **less-than-significant** level.

Mitigation Measure H-2.1: Design and Implement Stormwater Management Measures

The County shall design and implement a drainage plan for stormwater management measures. The stormwater management measures should be designed such that they result in pre-project runoff peak flows and volumes.

C. Water Quality

Impact H-3: Temporary Impairment of Water Quality Associated with Roadway Construction (Less than Significant with Mitigation)

Some of the proposed roadway improvements, such as passing and turning lane additions, widening of shoulders, paving turnouts and new roadways may have the potential to cause temporary water quality impacts due to roadbed removal, grading, and other earth construction activities requiring earth movement. Construction activities associated with these activities can temporarily impair water quality because disturbed and eroded soil, petroleum products, and miscellaneous wastes may be discharged to receiving waters. Soil and associated contaminants that enter stream channels can increase turbidity, stimulate the growth of algae, increase sedimentation of aquatic habitat, and introduce compounds that are toxic to aquatic organisms. Construction materials such as fuels, oils, paints, and concrete are potentially harmful to fish and other aquatic life if released into the environment. The extent of potential effects depends on the erodibility of soil types encountered, type of construction practice, extent of the disturbed area, duration of the disturbance, timing of precipitation, and proximity to drainage channels. These potential releases of water quality pollutants into Carmel River are considered potentially significant water quality impacts. Implementation of **Mitigation Measure H-3.1** would reduce these impacts on water quality to a **less-than-significant** level.

Mitigation Measure H-3.1: Prepare a Stormwater Pollution Prevention Plan

The County will prepare and implement a SWPPP pursuant to the applicable NPDES general construction activity permit system or the Caltrans SWMP prior to construction of any specific improvement under the proposed program. The SWPPP shall identify standard erosion control measures (e.g., management, structural, and vegetative controls) to be implemented for all construction activities that expose soil. Erosion in disturbed areas would be controlled through grading operations that eliminate direct routes for conveying runoff to drainage channels, construction of erosion control barriers such as silt fences and mulching material, and reseeding disturbed areas with grass or other plants. These standard erosion control measures are expected to reduce the potential for soil erosion and sedimentation of drainage channels. The general contractor conducting the work would be responsible for constructing or implementing the measures, inspecting them regularly, and maintaining the measures in good working order.

Impact H-4: Long-Term Impacts Resulting in Impaired Water Quality Associated with the New Roadways (Less than Significant with Mitigation)

The proposed roadway improvements would introduce new paved (impermeable) surfaces into the watershed, which may cause or result in the long-term releases of water quality pollutants into receiving waters (i.e., Carmel River). This impact is considered potentially significant. Implementation of **Mitigation Measure H-4.1** would minimize this impact to a **less-than-significant** level.

Mitigation Measure H-4.1: Conduct Site Specific Water Quality Analysis and Treatment

The County shall conduct site-specific water quality assessments for each roadway improvement project prior to commencement of construction. The assessment shall identify the project's potential to contribute to long-term water quality pollution due to increases in impermeable surfaces, and prescribe site-specific treatment measures to avoid or minimize that project's contribution to water quality degradation of receiving waters. Treatment measures can include, but are not limited to, bioswales and stormwater detention basins.

D. Groundwater Supply

Impact H-5: Potential Interference with Groundwater Recharge (Less than Significant with Mitigation)

Widened roadways proposed under the program would result in an increase of paved (impermeable) surfaces. Any such increase within a groundwater recharge area could reduce the amount of water that percolates into underlying aquifers. Although the average contribution to groundwater from percolating rainwater is considered minimal in the program area, the extent of project-specific impacts related to the depletion or interference with groundwater recharge have not been determined. Therefore, this impact is considered potentially significant. Implementation of **Mitigation Measure H-5.1** would reduce this impact to a **less-than-significant** level.

Mitigation Measure H-5.1: Design and Install Infiltration Devices

In areas where groundwater recharge occur, the County shall design and implement drainage plans that include considerations for installing appropriate stormwater infiltration devices to reproduce the natural recharge rates of the area that would be paved.

E. Risk of Flooding

Impact H-6: Potential Exposure of People or Structures to Significant Risk from Flooding (Less than Significant with Mitigation)

Construction of new roadway facilities may occur within a designated 100-year floodplain or floodway. Construction within a floodplain or floodway can alter floodplain storage and conveyance capacity of existing channels. Placement of roadways within 10-year or a designated 100-year floodplain may expose people or structures to a significant risk from flooding. This impact is considered potentially significant. Implementation of **Mitigation Measure H-6.1** would reduce the impact to a **less-than-significant** level.

Mitigation Measure H-6.1: Prevention of Risk to People or Structures from Flooding

The County shall conduct site-specific hydraulic modeling analyses for each project in accordance with all federal, state, and local regulations to assess whether new roadway facilities would impede floodflows or expose people or structures to the risk of flooding. The County shall use the results of the hydraulic modeling to design future projects to avoid substantial increases in flooding. The County shall ensure that project designs address conveyance capacities of existing channels such that the project would not contribute to additional flooding or restriction of floodwater conveyance within existing culverts or under existing bridges.

F. Risk of Inundation by Seiche, Tsunami, or Mudflow

Impact H-7: Increased Likelihood of Inundation by Seiche, Tsunami, or Mudflow (Less than Significant)

The effects of tsunamis and seiche depend on elevation and proximity to the ocean. The proposed program is not near any large inland waterbodies or the Pacific Ocean. The closest large water body is Carmel Bay, connected to the Pacific Ocean, about 1 mile west of the program area. The proposed roadway improvement areas are topographically separated from Carmel Bay and, thus from tsunami or seiche exposure. Therefore, potential impacts from tsunami and seiche are highly unlikely and are considered **less-than-significant**.

The proposed program would take place in relatively flat areas, without being constructed directly on steep hillsides or cliffs. Thus, potential impacts from mudflows are highly unlikely and are considered less-than-significant. No mitigation is required. Discussion of potential geotechnical impacts of the proposed program is provided in *Section 3.1, Geology, Soils, and Seismicity*.