4.8 HYDROLOGY AND WATER QUALITY

4.8.1 INTRODUCTION

This section describes the existing hydrology and water quality within the Specific Plan Area and provides an analysis of the potential impacts with implementation of the proposed project. As appropriate, the relevant regulatory requirements and Specific Plan implementation measures are provided to address the environmental effects.

Section 4.16, Utility and Service Systems, of this Environmental Impact Report (EIR) describes the existing water supply within the Specific Plan Area and provides an analysis of the potential impacts with implementation of the proposed project.

The analysis in this section is based on information from a technical report titled Hydrology and Water Quality Report, Kern River Valley Specific Plan Kern County, California, prepared by Smith-Gutcher and Associates, Inc., dated April 15, 2010. This technical report is provided as Technical Appendix F to this EIR.

4.8.2 ENVIRONMENTAL SETTING

Regional Location and Setting

The Specific Plan covers approximately 110,510 acres (173 square miles) in the northeastern portion of Kern County within the Sierra Nevada Mountains, adjacent to the Kern/Tulare County boundary. The Specific Plan Area includes the unincorporated communities of Lake Isabella, Bodfish, Alta Sierra, Wofford Heights, Kernville, Weldon and Onyx, South Lake/Longview, Mountain Mesa, and Squirrel Mountain Valley. These communities are regionally connected to each other and to areas outside of the Specific Plan Area by State Route (SR) 178 and SR 155.

Figure 4.6-1 in Section 4.6, Geology and Soils, of this EIR provides a topographic map of the Specific Plan Area. As indicated in Figure 4.6-1, the Specific Plan Area includes Isabella Reservoir (also referred to as Lake Isabella), the North and South Forks of the Kern River, and significant landforms that form the base of the Sierra Nevada Mountains. The northern and eastern portions of the Specific Plan Area are located in the Greenhorn Mountains, with elevations ranging from 3,100 to 7,100 feet above sea level (ASL). This portion of the Specific Plan Area includes the mountain summit community of Alta Sierra, located on a plateau within the Greenhorn Mountains, at an elevation of approximately 6,000 feet ASL. The southeastern portion of the Specific Plan Area, including portions of the Piute and Scodie Mountains, has elevations ranging from 3,300 to 5,900 feet ASL. The Specific Plan Area encompasses parts of the Sequoia National Forest, including the Dome Land and Kiavah Wilderness Areas. The majority of the property located within the Specific Plan Area is under the jurisdiction of federal agencies consisting of the Bureau of Land Management (BLM), the U.S. Forest Service (USFS), and the U.S. Army Corps of Engineers (ACOE).
4.8 Hydrology and Water Quality

Surface Water Conditions

Watersheds

A watershed is a geographic area that drains water, sediment, and other material into a particular watercourse or body of water. The Specific Plan Area lies in the Kern River Valley watershed, of which the dominant surface water features are the North and South Forks of the Kern River. Topographically, these drainages are bounded by the steep face of the granitic highlands of the southern Sierra Nevada Mountains. The watersheds of the North and South Forks of the Kern River encompass the interior of the entire southern Sierra Nevada from as far north as the western flank of Mount Whitney and both drain into Isabella Reservoir. In addition to these two principal watersheds, there are three additional significant watersheds: Kelso Creek that drains into the South Fork; Tillie Creek that drains into Isabella Reservoir; and Hot Springs Valley, including Erskine and Bodfish Creeks, that drains into the lower Kern River below the Isabella Dam. Figure 4.8-1 provides the location of these water features within the Specific Plan Area.

Drainage

The drainage area of the Kern River from its headwaters (originating near Mount Whitney, the tallest peak in California) to Isabella Dam is 2,074 square miles. The ACOE completed construction of Isabella Dam in 1953. The Isabella Dam holds Kern River water in what is known as Isabella Reservoir (also referred to as Isabella Lake), a reservoir with a maximum water storage capacity of 568,000 acre-feet. The primary purpose of the dam and reservoir is flood control and water supply regulation. The total storage capacity of Isabella Reservoir is reserved for downstream water rights holders, except for a 30,000 acre-feet minimum pool. The minimum pool volume cannot be utilized by the downstream water users and must remain in Isabella Reservoir.

About 95 percent of the existing surface water resources in the Specific Plan Area are used for irrigation, with the remainder used for domestic uses. The average inflows to Isabella Reservoir were 731,000 acre-feet/year for the years 1954 to 2000 with the inflows ranging from 175,000 to 2,312,000 acre-feet/year. The rights to water from the North and South Forks of the Kern River and Isabella Reservoir are held by various downstream irrigation interests, agricultural districts, public water agencies, Southern California Edison (SCE), and landowners along the South Fork River, including the Kern River Preserve. In addition, California Water Company (Cal Water), the largest purveyor of water in the Kern River Valley, has entitlement to 1,000 acre-feet/year of the flow of the North Fork of the Kern River. The 1,000 acre-feet/year of surface water diverted from the Kern River is treated at Cal Water’s surface water treatment plant in Kernville which has an existing capacity of 1.5 million gallons per day (mgd). This entitlement is obtained through a purchase agreement with the City of Bakersfield. There is no additional water directly available from the Kern River or the Isabella Reservoir to the Specific Plan Area.
Surface Water Features and Groundwater Basins in Specific Plan Area

4.8 Hydrology and Water Quality

Groundwater Conditions

Groundwater is the supply of fresh water found beneath the Earth’s surface and, in the Specific Plan Area, serves as a primary source of water supply. A groundwater basin is a three-dimensional area underlain by permeable materials capable of storing a substantial amount of water; it includes both the surface area and all of the subsurface fresh water-yielding material. The Specific Plan Area is located in the Kern River Valley Groundwater Basin, which includes the Specific Plan Area in the southern Sierra Nevada Mountains at elevations ranging from 2,500 to 7,100 feet ASL. Figure 4.8-1 provides the boundaries of the Kern River Valley Groundwater Basin within the Specific Plan Area. As shown in Figure 4.8-1, it is irregularly shaped, reflecting the drainage pattern of the North and South Forks of the Kern River, Kelso Creek, Tillie Creek, Erskine Creek, and other smaller tributary creeks. The basin is bounded by the Dome Land Wilderness Area to the north, Piute and Kiavah Mountains to the south and east, and the Greenhorn Mountains and Kern Canyon Fault to the west. The southern portion of the basin is dominated by the Isabella Reservoir, from which the lower Kern River flows toward the San Joaquin Valley.

Groundwater in the Kern River Valley occurs in alluvium, a sedimentary material deposited by rivers and streams that derives from the granite and metamorphic bedrock surrounding the basin. Alluvium consists of coarse deposits, such as sand and gravel, and finer-grained deposits such as clay and silt. The coarse sand and gravel deposits usually have the best water storage capability and are termed aquifers. The finer-grained clay and silt deposits that have relatively poor water storage capability are called aquitards. Most of the basin is characterized by alluvial aquifers with the exception of the aquitards found in the northern and southwestern portions of the Kern River Valley Groundwater Basin.

Groundwater pumped from the basin is the primary water supply source for the Kern River Valley. However, groundwater rights in the Kern River Valley groundwater basin are not adjudicated and there is no established groundwater management plan for the basin. Groundwater producers generally pump as much water as is needed to meet demands until water levels drop to a point of declining production. Consequently, the Kern River Valley has been subject to various moratoria due to groundwater quality and quantity issues.

Groundwater recharge is defined as the natural or intentional infiltration of water from the surface into groundwater reservoirs. Groundwater recharge in the Kern River Valley occurs through direct precipitation and infiltration along the Valley’s margins. Recharge also occurs along the North and South Forks of the Kern River, and along tributaries such as Kelso, Tillie (including Ice House Creek in Alta Sierra), and Erskine Creeks. A study of the sources of the shallow groundwater in the Hot Springs Valley conducted by the firm KOMEX in 2003 used a chloride mass balance approach to estimate that 7 percent of the average annual precipitation of 13.6 inches per year infiltrates into the groundwater basin. This equates to a groundwater recharge from precipitation on the order of 8,766 acre-feet/year in the Specific Plan Area.
Inflows to the groundwater basin may be on the order of 8,000 to 10,000 acre-feet/year on average, but may vary significantly due to local hydrologic conditions. Existing production could potentially consume most of this inflow, exclusive of other losses from the basin, such as evapotranspiration and subsurface outflow, which are discussed in greater detail below.

**Groundwater Basins**

For the analysis provided in this EIR, the groundwater system beneath the Specific Plan Area has been subdivided into four alluvial groundwater basins as well as a fractured granitic groundwater aquifer that underlies the entire Specific Plan Area. Figure 4.8-1 provides the locations and boundaries of these groundwater basins. The alluvial groundwater basins are generally similar in geologic setting and composition. Smaller alluvial systems were incorporated into the adjacent larger alluvial groundwater basin such as Bull Run Creek into the North Fork of the Kern River Groundwater Basin and Fay Canyon, Lynch Canyon, Scodie Canyon, and Smith Canyon Creeks into the South Fork of the Kern River Groundwater Basin. The Tillie Creek watershed, including Ice House Creek in Alta Sierra, has an insufficient volume of alluvium overlying the granitic bedrock to be categorized as an alluvial groundwater basin.

The following provides a description of the four alluvial groundwater basins and the fractured granitic groundwater aquifer that underlies the Specific Plan Area. Refer to Technical Appendix F of this EIR for additional information.

**North Fork of the Kern River Groundwater Basin**

The North Fork of the Kern River Groundwater Basin follows the trend of the Kern Canyon Fault to the north of Isabella Reservoir. The alluvial aquifer material within the North Fork of the Kern River Groundwater Basin is composed of alluvial fan and flood plain deposits from the North Fork of the Kern River and other intermittent streams. The basin is approximately one half mile wide to the north of the Kern River Bridge in Kernville and expands to over one mile wide to the south of the Kern River Bridge downstream until the North Fork of the Kern River drains into Isabella Reservoir. The alluvium is underlain by granitic bedrock and varies in thickness from only a few feet to a maximum thickness of approximately 50 feet in the southern portion of the basin.

The depth to groundwater is very shallow throughout the alluvial basin and, given the edge effects and maximum thickness along the axes, the thickness of saturated soils to the north of the Kern River Bridge is estimated to average 10 feet and to the south of the Kern River Bridge is estimated to average 30 feet.

**South Fork of the Kern River Groundwater Basin**

The South Fork of the Kern River Groundwater Basin is approximately two to three miles mile wide to the east of the eastern extremity of the Isabella Reservoir. The alluvial aquifer material within the South Fork of the Kern River Groundwater Basin is composed of alluvial fan and flood plain deposits from the South Fork of the Kern River and other intermittent streams. The alluvium is underlain by granitic bedrock and varies in
thickness from only a few feet to a maximum thickness of approximately 400 feet in the center of the axes of the basin.

The depth to groundwater is very shallow throughout the alluvial basin, and given the edge effects and maximum thickness along the axes, the average thickness of saturated soils is estimated to be 200 feet.

Pumping rates of water wells constructed in alluvial groundwater basins is generally directly proportional to the diameter of the well and the length of the perforated well casing. Larger diameter and long well screen wells, such as wells drilled near the banks of the South Fork of the Kern River, have achieved pumping rates ranging from 100 to 1,000 gallons per minute (gpm) and more.

Kelso Creek Groundwater Basin
The Kelso Creek Groundwater Basin is approximately three miles wide as it merges into the South Fork of the Kern River Basin and narrows to less than one half mile wide four miles to the south at the southern boundary of the Specific Plan Area. The alluvial aquifer material within the Kelso Creek Groundwater Basin is composed of alluvial fan and flood plain deposits of Kelso Creek and other intermittent streams. The alluvium is underlain by granitic bedrock and varies in thickness from only a few feet to a maximum thickness of approximately 200 feet in the center of the axes of the basin.

The depth to groundwater is very shallow throughout the alluvial basin, and given the edge effects and maximum thickness along the axes, the average thickness of saturated soils is estimated to be 100 feet.

Hot Springs Valley Groundwater Basin
The Hot Springs Valley Groundwater Basin is approximately two miles wide as it merges into the lower Kern River below the Isabella Dam and each creek’s alluvium narrows to less than one half mile wide three miles to the southeast at the southern boundary of the Specific Plan Area. The alluvial aquifer material within the Hot Springs Valley Groundwater Basin is composed of alluvial fan and flood plain deposits of Erskine Creek, Bodfish Creek, and other intermittent streams. The Hot Springs Valley derives its name from the Scovern Hot Springs and other unnamed springs where deep thermal waters flow as springs at the surface of the valley floor. The alluvium is underlain by granitic bedrock and varies in thickness from only a few feet to a maximum thickness of approximately 150 feet in the center of the axes of the basin.

The depth to groundwater is very shallow throughout the alluvial basin, and given the edge effects and maximum thickness along the axes, the average thickness of saturated soils is estimated to be 50 feet.
Fractured Granitic Groundwater Aquifer

Underlying the alluvial groundwater basins there is a fractured granitic groundwater aquifer. This lower hydrostratigraphic unit consists of the several varieties of medium to coarse grained intrusive igneous rock forming a bedrock unit that underlies the entire Specific Plan Area. There are also isolated roof pendants of metamorphic rock that outcrop in less than 10 percent of the Specific Plan Area. The water in the bedrock unit is held in several joint and fracture sets in the crystalline bedrock unit. Usable water storage space (porosity) within the rock is dependent on the radii of the fractures. Although these fractures may extend several hundred feet into the subsurface, overburden pressure tends to squeeze the fractures closed at depths below 300 feet. Generally the storage within a crystalline rock unit due to joint and fracture sets is estimated to be approximately one percent of the volume of the rock unit. The water storage in the metamorphic roof pendants is highly variable. The Kernville Schists are a low grade metamorphic sandstone in the western portions of the Specific Plan Area that has good porosity and is highly permeable. However, the metamorphic limestone in the southeastern portion of the Specific Plan Area has very poor permeability.

Groundwater pumping rates for wells constructed within the fractured granite is generally directly proportional to the bulk porosity. In the earthquake fractured zones, pumping rates of 50 to 100 gpm or more are observed. In significant drainages such as Ice House Creek and Tillie Creek, pumping rates of 20 to 50 gpm are observed. However, in much of the Specific Plan Area, pumping rates are less than 20 gpm and frequently as low as 1 to 5 gpm. In general, water wells completed in the granitic or metamorphic bedrock have lower production rates and will cumulatively recover a smaller quantity of groundwater than wells completed in the alluvial aquifers such as those flanking the North and South Forks of the Kern River. Locating bedrock water wells within drainage courses or within extensive fracture zones substantially increases the effective porosity, flow rates, and quantity of recoverable groundwater over bedrock water wells located outside of these areas.

Aquifer Storage in the Groundwater Basins

An estimation of the total storage within the aquifers in the groundwater basins in the Specific Plan Area was calculated in Technical Appendix F to this EIR. Based on that analysis, the following conclusions were made:

- The calculated volume of storage in the alluvial fill found in the North Fork of the Kern River Groundwater Basin is approximately 19,200 acre-feet. This is based on a saturated alluvial fill interval average of 10 feet in the portion of the basin that has an average width of 0.5 miles for the two miles (640 acres) within the Specific Plan Area above the Kern River Bridge and saturated alluvial fill interval average of 30 feet in the portion of the basin that has an average width of one mile for the three miles (1,920 acres) within the Specific Plan Area below the Kern River Bridge. This estimate does not include the saturated alluvial aquifer of the North Fork of the Kern River that is currently submerged beneath the Isabella Reservoir which extends an additional three miles beneath the Isabella Reservoir and contains an additional 17,200 acre-feet of storage. The Tillie Creek.
Watershed (including Ice House Creek in Alta Sierra) has an insufficient volume of alluvium overlying the granitic bedrock to be included in the calculation of alluvial groundwater storage.

- The calculated volume of storage in the alluvial fill found in the South Fork of the Kern River Groundwater Basin is approximately 768,000 acre-feet based on a saturated alluvial fill interval average of 200 feet in the portion of the basin that has an average width of two miles for the ten miles (12,800 acres) within the Specific Plan Area. This estimate does not include the saturated alluvial aquifer of the South Fork of the Kern River that is currently submerged beneath the Isabella Reservoir which extends an additional three miles beneath the Isabella Reservoir and contains an additional 230,400 acre-feet of storage.

- The calculated volume of storage in the alluvial fill found in the Kelso Creek Groundwater Basin is approximately 76,800 acre-feet based on a saturated alluvial fill interval average of 100 feet in the portion of the basin that has an average width of one mile for the four miles (2,560 acres) within the Specific Plan Area.

- The calculated volume of storage in the alluvial fill found in the Hot Springs Valley Groundwater Basin is approximately 28,800 acre-feet based on a saturated alluvial fill interval average of 50 feet in the portion of the basin that has an average width of one mile for the three miles (1,920 acres) within the Specific Plan Area.

- The calculated volume of storage in the fractured crystalline bedrock is approximately 331,500 acre-feet based on a conservative bulk porosity of 1 percent for the 300 feet of saturated fractured crystalline bedrock over the 110,500 acres within the Specific Plan Area.

Estimated total volume of water in storage in the Specific Plan Area is approximately 1,224,300 acre-feet. This estimate does not include the saturated alluvial aquifer of the North and South Forks of the Kern River that is currently submerged beneath the Isabella Reservoir which contains an additional 247,600 acre-feet of storage.

In summary, the alluvial system of the South Fork of the Kern River is the most productive groundwater basin and is capable of supporting the greatest increase in future groundwater demand. The other smaller alluvial groundwater basins within the Specific Plan Area are closely monitoring any increases in demand within the recoverable yield of these smaller aquifers. The areas of the Specific Plan Area that use fractured granitic or metamorphic bedrock as the principal source of groundwater may be susceptible to localized excessive demand.
Hydrologic Budget for Specific Plan Area

A hydrologic budget is a means of describing the volume of water contributed, retained, and transmitted out of a geographic area. A hydrologic budget for the Specific Plan Area has been prepared through the use of a variety of available data sources and the use of examples that have been prepared from other areas in California.

A detailed discussion of the hydrologic budget prepared for the Specific Plan area is provided in Technical Appendix F to this EIR. The calculation of a hydrologic budget requires four data set components: Precipitation; Evaporation/Evapotranspiration; Recharge/Runoff; and Underflow. In addition, the groundwater pumped from the Specific Plan Area for municipal, domestic, and agricultural uses was considered. The following summarizes the four data set components and the amount of groundwater pumped that was used in the analysis.

Precipitation

The precipitation record collected over a 29-year span (1971 to 2000) was used to establish the annual average rainfall for the Specific Plan Area. Based on this, the average annual precipitation of 13.6 inches per year within the 110,510-acre Specific Plan Area was calculated, which equates to approximately 125,233 acre-feet/year.

Evaporation/Evapotranspiration

Evaporation/Evapotranspiration is the volume of water transferred out of the basin either through direct evaporation or through the uptake and transmission of groundwater by vegetation and associated watersheds. Although direct evaporation has little to no impact on groundwater, evapotranspiration (ETO) can result in large volumes of groundwater being removed from a basin. The ETO for the Specific Plan Area was calculated based on the volume of vegetation per acre. Accounting for the 11,400 acres within the Isabella Reservoir, approximately 60 percent of the Specific Plan Area has significant vegetation resulting in an average water uptake factor of approximately 1 acre-feet/year per acre of vegetation. The ETO was calculated by multiplying the average number of plants present in one acre by the average volume of water each plant uses per year. The resulting product is the average volume of water used by one acre of vegetated land. The total ETO for the Specific Plan Area was calculated by multiplying that product by the number of vegetated acres in the Specific Plan Area. This resulted in a calculated ETO of 66,300 acre-feet/year.

Recharge/Runoff

Recharge/Runoff is the volume of precipitation that is either contributed to the groundwater system in the form of direct percolation or transferred within/transmitted out of a basin in the form of surface water flows (runoff). Only a portion of the rain (or snowmelt) that is contributed to a watershed is transferred within/transmitted out as runoff. Runoff results from precipitation not taken up by infiltration into the soil, interception, depression storage, and direct evaporation.
Recharge within the Specific Plan Area is a result of two sources, infiltration from precipitation and manmade recharge. It is estimated that 7 percent of the average annual precipitation of 13.6 inches per year infiltrates into the groundwater basin. This equates to a groundwater recharge on the order of 8,766 acre-feet/year within the Specific Plan Area.

Waste water disposal within the Specific Plan Area is from individual septic systems with the exception of a single residential subdivision in Lake Isabella (Reeder Tract) that has a community waste water treatment system. Given the average temperature, depth to groundwater, and soil types, it is estimated than in excess of 50 percent of the waste waters from the 2,568-acre-feet/year municipal and domestic uses returns to the groundwater aquifer as 1,284 acre-feet/year in artificial recharge. In addition, the Kern County Water Agency estimates that in excess of 50 percent of the 3,900-acre-feet/year in agricultural water supply, principally irrigation adjacent to the South Fork of the Kern River, returns to the groundwater aquifer as 1,950 acre-feet/year in additional artificial recharge. The estimate of manmade recharge is 3,234 acre-feet/year.

Underflow

Underflow enters the Specific Plan Area in the alluvium beneath the surface water drainages, principally the North and South Forks of the Kern River, as well as from fractured bedrock in the higher elevations of the Sierra Nevada Mountains. Similarly underflow leaves the Specific Plan Area in alluvium, principally the lower Kern River, as well as fractured bedrock at lower elevations of the Sierra Nevada. To accurately calculate the relative volumes of underflow requires that the groundwater level be monitored throughout the Specific Plan Area in order to determine whether the groundwater levels are rising or falling. There is anecdotal evidence that the volume of underflow into the Specific Plan Area is greater than the volume of underflow leaving the Specific Plan Area. While the Kern County Water Agency is unaware of water wells going dry within the Specific Plan Area and there are numerous springs within the Specific Plan Area which continue to flow even during extended periods of droughts, there are wells in localized areas such as Wofford Heights that encounter diminished production during drought conditions. While there are several alluvial systems which enter the Specific Plan Area, principally the alluvium underlying the South Fork of the Kern River, the only alluvial system exiting the Specific Plan Area is the very limited alluvium beneath the lower Kern River.

Groundwater Pumping

In order to calculate the hydraulic budget, the amount of groundwater pumped from the Specific Plan Area for municipal, domestic, and agricultural uses was determined. According to the State of California Department of Health Services (DHS), 49 water purveyors serve the Specific Plan Area. Table 4.8-1 provides a list of water purveyors in the Specific Plan Area, the number of customer service connections, and the population served in the Specific Plan Area in the year 2003.
### TABLE 4.8-1
WATER PURVEYORS IN THE SPECIFIC PLAN AREA

<table>
<thead>
<tr>
<th>Name of Purveyor</th>
<th>Community Served</th>
<th>Existing Number of Connections</th>
<th>Existing Population Served</th>
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<tr>
<td><strong>Community Water Systems Under PUC Regulation</strong></td>
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<td></td>
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<tr>
<td>California Water Services Company</td>
<td>Ponderosa Pine, Mountain Shadows, Juniper Hills, Countrywood, Upper Bodfish, Lakeland, Split Mountain, Onyx Water, Squirrel Mountain</td>
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<td>Mountain Mesa Water Company</td>
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<td>Long Canyon Water Company Corporation</td>
<td>Prince Ranch</td>
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<td>197</td>
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<td>James Water System</td>
<td>Kernville</td>
<td>19</td>
<td>40</td>
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<td><strong>Subtotal</strong></td>
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<td><strong>Mutuals (Community Water Systems not Under PUC Regulation)</strong></td>
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<td>Tradewind Water Association</td>
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<td>Canyon Meadows Mutual Water</td>
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<td>Sierra Bella Mutual Water Company</td>
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<td>Riverkern Mutual Water Company</td>
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<td>Rainbird Valley Mutual Water Company</td>
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<td>Frontier Trail Homeowners Association, Inc.</td>
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<td>Hungry Gulch Water System</td>
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<tr>
<td>KRVWC - Kernvale Mutual Water Company</td>
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<td>52</td>
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<td><strong>Subtotal</strong></td>
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<td><strong>2,415</strong></td>
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<tr>
<td><strong>Others (Community Water Systems not Under PUC Regulation)</strong></td>
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<td>Rivernook Campground</td>
<td>Kernville</td>
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<td>Lake Isabella Community Services District</td>
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<td>CLM - Tillie Creek and Live Oak Campgrounds</td>
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<td>Lake Isabella KOA Campground</td>
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<td>USFS - Alta Sierra Water Company</td>
<td>Alta Sierra</td>
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Table 4.8-1 (cont’d)
List of Water Purveyors in the Kern River Valley

<table>
<thead>
<tr>
<th>Name of Purveyor</th>
<th>Community Served</th>
<th>Existing Number of Connections</th>
<th>Existing Population Served</th>
</tr>
</thead>
<tbody>
<tr>
<td>CLM - Hungry and Boulder Gulch Campgrounds</td>
<td>Lake Isabella</td>
<td>52</td>
<td>500</td>
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<tr>
<td>CLM - Main Dam and Pioneer Point Campgrounds</td>
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<td>Sierra Trailer Lodge MHP, LLC</td>
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<td>Jesse James Trailer Park</td>
<td>Wofford Heights</td>
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<tr>
<td>CLM - Paradise Cove Campground</td>
<td>Lake Isabella</td>
<td>30</td>
<td>520</td>
</tr>
<tr>
<td>Falling Waters River Resort</td>
<td>Kernville</td>
<td>30</td>
<td>80</td>
</tr>
<tr>
<td>Shady Lane Mobile Park</td>
<td>Bodfish</td>
<td>28</td>
<td>30</td>
</tr>
<tr>
<td>USFS - Shirely Loop Water Association</td>
<td>Alta Sierra</td>
<td>28</td>
<td>70</td>
</tr>
<tr>
<td>Fourth Street Water System</td>
<td>Lake Isabella</td>
<td>24</td>
<td>35</td>
</tr>
<tr>
<td>CCGC - Camp 9</td>
<td>Kernville</td>
<td>24</td>
<td>160</td>
</tr>
<tr>
<td>Camp Owen Water System</td>
<td>Kernville</td>
<td>23</td>
<td>220</td>
</tr>
<tr>
<td>Lake Isabella Motel and Trailer Park</td>
<td>Lake Isabella</td>
<td>18</td>
<td>60</td>
</tr>
<tr>
<td>Clark Street Community Well</td>
<td>Lake Isabella</td>
<td>16</td>
<td>25</td>
</tr>
<tr>
<td>Cyrus</td>
<td>Kernville</td>
<td>10</td>
<td>Unknown</td>
</tr>
<tr>
<td>USFS - LK Lake Isabella Office Waters</td>
<td>Lake Isabella</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>Kern Valley Courts Complex</td>
<td>Lake Isabella</td>
<td>3</td>
<td>290</td>
</tr>
<tr>
<td>Paradise Cove Lodge</td>
<td>Lake Isabella</td>
<td>3</td>
<td>150</td>
</tr>
<tr>
<td>Tradewinds II</td>
<td>Lake Isabella</td>
<td>2</td>
<td>250</td>
</tr>
<tr>
<td>Kern Valley Golf Course</td>
<td>Kernville</td>
<td>1</td>
<td>500</td>
</tr>
<tr>
<td>Slugger’s Saloon</td>
<td>Lake Isabella</td>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td>South Fork Middle School</td>
<td>Weldon</td>
<td>1</td>
<td>204</td>
</tr>
<tr>
<td>South Fork School Water System</td>
<td>Weldon</td>
<td>1</td>
<td>154</td>
</tr>
<tr>
<td>South Fork Woman’s Club, Inc.</td>
<td>Weldon</td>
<td>1</td>
<td>60</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
<td><strong>1,036</strong></td>
<td><strong>8,335</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>8,418</strong></td>
<td><strong>25,039</strong></td>
</tr>
</tbody>
</table>


1 Data represents number of connections and population served in 2003.
2 California Water Services Company has an Urban Water Management Plan consistent with the requirements of Senate Bill 610.
As indicated in Table 4.8-1, Cal Water provides water service to 4,401 connections (about 55 percent of the total connections) in the Specific Plan Area. During the past decade, Cal Water’s average production was approximately 1,407 acre-feet/year, ranging from 1,200 to 1,550 acre-feet/year.

As indicated in Table 4.8-1, James Water System, Long Canyon Water Company Corporation, Mountain Mesa Water Company, and Erskine Creek Water Company, which are regulated by the California Public Utility Commission (PUC), provide water service to 12,981 connections (about 35 percent of the total connections). In addition, there are 18 mutual water companies and 26 private well owners that are not regulated by the PUC and primarily serve smaller communities and developments in the Specific Plan Area and/or specific establishments such as campgrounds, hotels, motels, trailer parks, lodges, and schools. Forty of the 49 water purveyors serve fewer than 100 people or only provide water during the summer months. Detailed production records are not available for most of these purveyors. However, utilizing a similar level of demand as Cal Water’s customers, it is estimated that there is a demand of 1,161 acre-feet/year for the non-Cal Water customers, ranging from 2,100 to 2,700 acre-feet/year.

Agriculture in the Specific Plan Area utilizes groundwater that is pumped from private water wells and surface water diversions from the South Fork of the Kern River in the vicinity of Weldon, Kelso Valley, and Onyx. The Kern County Agricultural Commissioner estimates indicate that approximately 1,500 acres of farmland are irrigated annually. The total agricultural demand is estimated to be about 3,900 acre-ft/year. However, due to insufficient data, the percentages of this demand supplied by surface water diversions from the Kern River and from groundwater supplies are unclear. It is assumed that agricultural demand is 10 percent higher in hot dry years and 10 percent lower in cool wet years. This results in an estimated range of 3,500 to 4,300 acre-ft/year.

Table 4.8-2 provides a summary of the estimate for existing municipal, domestic, and agricultural water demand in the Specific Plan Area. As indicated in Table 4.8-2, the estimated existing water demand is 6,468 acre-feet/year ranging from 5,600 to 7,000 acre-ft/year.

Calculation of Hydrologic Budget

Based on the discussion provided above, the change in groundwater storage in the Specific Plan Area equals the 125,233 acre-feet/year in precipitation less the 66,300 acre-feet/year in evapotranspiration, plus the addition of 8,766 acre-feet/year in infiltration, plus the 3,234 acre-feet/year in manmade recharge, less the 50,167 acre-feet/year in runoff, plus an undetermined net positive amount of underflow into the Specific Plan Area, and less the 6,468 acre-feet/year in groundwater pumping. Combining the components provided, there is an annual net positive amount in storage of approximately 14,298 acre-feet/year plus an undetermined net positive amount of underflow for the Specific Plan Area. Table 4.8-3 summarizes the calculation of the hydrologic budget.
### TABLE 4.8-2
**SUMMARY OF ESTIMATED EXISTING WATER DEMANDS IN SPECIFIC PLAN AREA**

<table>
<thead>
<tr>
<th>Type of Usage</th>
<th>Wet Year</th>
<th>Average Year</th>
<th>Dry Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Annual (Acre-Feet/Year)</td>
<td>Peak Demand (Million Gallons/Day)</td>
<td>Annual (Acre-Feet/Year)</td>
</tr>
<tr>
<td>Municipal and Domestic</td>
<td>2,100</td>
<td>3.4</td>
<td>2,500</td>
</tr>
<tr>
<td>Agricultural</td>
<td>3,500</td>
<td>6.2</td>
<td>3,900</td>
</tr>
<tr>
<td>Total</td>
<td>5,600</td>
<td>9.6</td>
<td>6,400</td>
</tr>
</tbody>
</table>

*Source: Kern River Valley Specific Plan EIR Water Supply Analysis, Montgomery Watson, 2005.*
### TABLE 4.8-3
**Calculation of Hydrologic Budget**
**in Specific Plan Area**

<table>
<thead>
<tr>
<th>Component</th>
<th>Amount of Groundwater (Acre-Feet/Year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Precipitation</td>
<td>125,233</td>
</tr>
<tr>
<td>Evapotranspiration</td>
<td>(66,300)</td>
</tr>
<tr>
<td>Recharge (Infiltration of Precipitation)</td>
<td>8,766</td>
</tr>
<tr>
<td>Recharge (Manmade)</td>
<td>3,234</td>
</tr>
<tr>
<td>Runoff</td>
<td>(50,167)</td>
</tr>
<tr>
<td>Groundwater Pumping</td>
<td>(6,468)</td>
</tr>
<tr>
<td>Underflow</td>
<td>Unknown</td>
</tr>
<tr>
<td><strong>Total Groundwater Storage</strong></td>
<td><strong>14,298 Acre-Feet/Year Net</strong></td>
</tr>
</tbody>
</table>

Water Quality

Domestic water supplies are required to meet water quality standards established by the State of California Department of Health Services (DHS) and the Environmental Protection Agency (EPA). To ensure that drinking water is safe to drink, EPA sets federal regulations that limit the amounts of certain contaminants in water provided by public water systems. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. As water travels over the surface of the land or through layers in the ground, it dissolves naturally-occurring minerals and, in some cases, radioactive material, and can pick up substances resulting from the presence of animal or human activity. Table 4.8-4 provides the contaminants of concern and the federal and State water quality standards.

Some domestic water wells in the Specific Plan Area have failed to meet the maximum contaminant levels (MCL) and public health goals for multiple contaminants. Naturally occurring arsenic, iron, manganese, and Radon-222 are the principle issues being addressed within Specific Plan Area, as well as localized areas where septic disposal systems in shallow groundwater settings have degraded groundwater quality. The quality of water produced by many of the smaller water purveyors is also in excess of MCL standards and public health goals for certain contaminants. The extent of treatment performed by the smaller purveyors is unknown. Cal Water, the largest water purveyor in the Specific Plan Area, has plans to maintain the reliability of its supplies by adding and/or expanding treatment facilities. Cal Water has five treatment plants in the Specific Plan Area that treat these contaminants. Table 4.8-4 provides the Cal Water treatment plants, the communities where they are located, and their respective capacities.

Arsenic contamination of Kern River Valley’s groundwater source is of particular concern because the new federal arsenic standards that have been in effect since January 2006 have been exceeded. The new standard of 10 parts per billion (ppb) will be exceeded by 10 of Cal Water’s wells, while Cal Water’s systems are within the former 50 ppb standard. Cal Water is working to maintain the reliability of its supplies by adding and expanding treatment facilities. Cal Water has increased the surface water treatment plant capacity in Kernville from .5 to 1.5 mgd to treat additional surface water from the Kern River and plans to treat water from wells with arsenic problems in the Kernville and Wofford Heights areas. Arsenic was also a problem for other water suppliers in the Lake Isabella area such as the Lake Isabella Community Service District (CSD). The CSD now purchases water from the Erskine Creek Water Company.

The quality of existing groundwater is also threatened by contamination from individual septic systems in areas with high groundwater levels. This is due to the high potential for groundwater contamination from older, improperly designed individual septic systems in the Lake Isabella community.
### TABLE 4.8-4
**CAL WATER TREATMENT PLANTS IN SPECIFIC PLAN AREA**

<table>
<thead>
<tr>
<th>Treatment Plant</th>
<th>Location</th>
<th>Capacity (Million Gallons/Day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface Water Treatment Plant</td>
<td>Kernville</td>
<td>1.50</td>
</tr>
<tr>
<td>Iron and Manganese Plant</td>
<td>Kernville</td>
<td>0.50</td>
</tr>
<tr>
<td>Iron and Manganese Plant</td>
<td>Wofford Heights</td>
<td>0.50</td>
</tr>
<tr>
<td>Reverse Osmosis Plant</td>
<td>Lakeland (Lake Isabella)</td>
<td>&lt; 0.25</td>
</tr>
<tr>
<td>Treatment at 1 well (small surface water plant)</td>
<td>Unknown</td>
<td>100</td>
</tr>
<tr>
<td>Arsenic, Uranium, Selenium, Nitrate, Vanadium, Fluoride, Iron, and Manganese</td>
<td>Upper Bodfish</td>
<td>200-250 gpm</td>
</tr>
<tr>
<td>Arsenic, Uranium, Iron, and Manganese</td>
<td>Lower Bodfish</td>
<td>200-250 gpm</td>
</tr>
</tbody>
</table>

*Source:  River Valley Specific EIR Water Supply Analysis, Montgomery Watson, 2005 based on data provided by Cal Water on April 9, 2004 and July 31, 2009.*
Southern Sierra Study

In June 2006, as part of the Statewide Basin Assessment Project of the Groundwater Ambient Monitoring and Assessment (GAMA) Program, groundwater quality in the approximately 1,800 square-mile Southern Sierra study unit (SOSA), which includes the Specific Plan Area, was investigated. The GAMA Statewide Basin Assessment Project was developed in response to the Groundwater Quality Monitoring Act of 2001 and is being conducted by the U.S. Geological Survey (USGS) in cooperation with the California State Water Resources Control Board (SWRCB). The Southern Sierra study was designed to provide a spatially unbiased assessment of raw groundwater quality within SOSA, as well as a statistically consistent basis for comparing water quality throughout California. Samples were collected from fifty wells in Kern and Tulare Counties. The groundwater samples were analyzed for a large number of synthetic organic constituents (VOCs, pesticides and pesticide degradates, pharmaceutical compounds, and wastewater-indicator compounds), constituents of special interest (perchlorate, N-nitrosodimethylamine [NDMA], and 1,2,3-trichloropropane [1,2,3-TCP]), naturally occurring inorganic constituents (nutrients, major and minor ions, and trace elements), radioactive constituents, and microbial indicators. Naturally occurring isotopes (tritium, and carbon-14, and stable isotopes of hydrogen and oxygen in water) and dissolved noble gases also were measured to help identify the source and age of the sampled groundwater. Refer to Technical Appendix F of this EIR for a detailed discussion of the findings of the SOSA.

The Southern Sierra study did not attempt to evaluate the quality of water delivered to consumers since after withdrawal from the ground, water typically is treated, disinfected, or blended with other waters to maintain acceptable water quality. Regulatory thresholds apply to treated water that is served to the consumer, not to raw groundwater. However, to provide some context for the results, concentrations of constituents measured in the raw ground water were compared with health-based thresholds established by the EPA and the California Department of Public Health (CDPH) and thresholds established for aesthetic concerns (secondary maximum contaminant levels [SMCL-CA]) by CDPH.

The SOSA included 14 wells within the Specific Plan Area from the communities of Kernville (SOSA-07 and SOSA-FP-02), Wofford Heights (SOSA-19 and 21), Alta Sierra (SOSA-15), Lake Isabella (SOSA-16), Bodfish (SOSA-17 and 20), Mountain Mesa (SOSA-14), South Lake (SOSA-03), Squirrel Valley (SOSA-18), Weldon (SOSA-31), Kelso (SOSA-30), and Onyx (SOSA-10). Samples were analyzed for volatile organic compounds, pesticides and pesticide degradates, pharmaceutical compounds, constituents of special concern (NDMA, perchlorate, 1,2,3-TCP), naturally occurring inorganic constituents (nutrients, major ions, and trace elements), radioactive constituents, and microbial indicators. The data from those wells is provided in Attachment D in Technical Appendix F to this EIR.

It was determined that the groundwater quality in the Specific Plan Area is generally high. None of the wells sampled contained concentrations of contaminants above State or federal maximum contamination levels, health advisory levels, or notification levels.
However, arsenic was detected in excess of the EPA maximum contaminant level (US-MCL) at concentrations of 23 µg/l and 25 µg/l, respectively, in the samples from wells SOSAFP-02 and SOSA-07, which are in Kernville, and at a concentration of 11 µg/l in the sample from well SOSA-03, which is in South Lake. Iron was detected in excess of the US-MCL at concentrations of 4,200 µg/l and 934 µg/l, respectively, in the samples from wells SOSAFP-02 and SOSA-07, which are in Kernville. Manganese was detected in excess of the US-MCL at concentrations of 2,250 µg/l and 329 µg/l, respectively, in the samples from wells SOSAFP-02 and SOSA-07, which are in Kernville. Radon-222 were detected in excess of the US MCL at concentrations of 4,670 pCi/l and 2,240 pCi/l, respectively, in the samples from wells SOSAFP-02 and SOSA-03, which are in Kernville, and at a concentration of 1,670 pCi/l in the sample from well SOSA-03, which is in South Lake. Total coliform bacteria colonies were detected at concentrations of 3 coliform colonies/100 ml and 1 coliform colony/100 ml in the samples from wells SOSA-03 and SOSA-07, which are in South Lake and Kernville, respectively. These exceed the US-MCL of 5 percent of samples per month. Elevated arsenic, iron, manganese, and Radon-222 in groundwater are not indicative of a particular source of pollution and may be naturally occurring.

**Cal Water Annual Water Quality Reporting**

As discussed above, groundwater pumped from the Specific Plan Area is for municipal, domestic, and agricultural uses. Cal Water publishes annual water quality reports for each of the water systems that it operates. Since the systems operated by Cal Water are located throughout the Specific Plan Area, this information is provided as a representative of water quality within the Specific Plan Area. Attachment E in Technical Appendix F to this EIR provides excerpts from the 2007 Water Quality Reports for Countrywood, Kernville-Wofford Heights, Lakeland, Lower Bodfish, Mountain Mesa, Mountain Shadows, Onyx, Ponderosa Pine, South Lake, Split Mountain, Squirrel Mountain, and Upper Bodfish. The report for Countrywood indicates that manganese was detected at a concentration of 61 µg/l, which is in excess of the CA-SMCL of 50 µg/l. The report for Lower Bodfish indicates that arsenic was detected at concentrations ranging from non-detect to 15 µg/l, which is in excess of the US-MCL of 10 µg/l. The report for Lower Bodfish also indicates that iron was detected at concentrations ranging from non-detect to 900 µg/l, which is in excess of the CA-SMCL of 300 µg/l. The report for Mountain Shadows indicates that manganese was detected at concentrations ranging from non-detect to 114 µg/l, which is in excess of the CA-SMCL. The report for Ponderosa Pine indicates that manganese was detected at a concentration of 65 µg/l, which is in excess of the CA-SMCL. The report for South Lake indicates that copper was detected at a concentration of 1.5 µg/l, which is in excess of the US-HAL of 1.3 mg/l.

**Hazardous Materials Release Sites**

A review of government databases which included the Specific Plan Area was conducted by Smith-Gutcher and Associates, Inc. The purpose of the database review is to identify facilities with reported hazardous materials or hazardous waste releases or sites with the potential to release hazardous materials or hazardous waste that could impact the
groundwater within the Specific Plan Area. There are two principal categories of facilities that have had releases in sufficient quantities to potentially threaten the groundwater quality within the Specific Plan Area. These are existing and former service stations and former landfills.

Leaking underground fuel storage tanks (LUFT) have been discovered in most of the communities surrounding the Isabella Reservoir. The LUFT sites are at various stages of the investigation and cleanup process. In most cases the gasoline and/or diesel-containing soils are excavated and disposed of at a licensed facility. Since these service stations are located in the communities surrounding the Isabella Reservoir and the depth to groundwater is generally shallow, the petroleum releases impacted the groundwater beneath the sites. However, petroleum hydrocarbons are rarely detected more than 200 feet down gradient of the source area. Groundwater mitigation includes long-term groundwater monitoring and has generally been limited to the source removal and documenting natural attenuation processes. In 2008, the underground aviation fuel storage tank and dispensers were removed from the Kern Valley Airport without an indication of a petroleum release. There are several vehicle maintenance facilities within the Specific Plan Area. However, none are listed as a source of a hazardous materials release.

Flood Hazards

The communities of Weldon, Kelso Valley, and Onyx, areas in Lake Isabella along Erskine Creek, portions of Mountain Mesa, and portions of Kernville are all subject to flooding in the event of a severe rainstorm. Several factors create conditions where flooding could pose a safety risk to residents and structures within these areas. Among them are the Kern River and its tributaries, downstream siltation, and fluctuations in water levels in Isabella Reservoir. In December 1966, a storm resulted in a stream flow of 27,800 cubic feet per second (cfs) which flooded and severely damaged the town of Onyx. Also in 1966, the Kern River Bridge in Kernville was washed out. Other significant flooding events have occurred in 1969, 1980, 1997, and 1998. During severe rainstorms, several roads historically have flooded, including Sierra Way, SR-178, Fay Ranch Road, and Lake Isabella Boulevard. In addition, the Sierra Way Bridge, located in South Fork, is periodically flooded and temporarily hinders circulation in the area.

Existing Flood Control Measures

During the site reconnaissance, a visual survey of existing flood control measures was conducted. Flood control devices and structures were not observed in the majority of the Specific Plan Area. Some rudimentary flood control measures were observed, such as culverts to allow streams to flow under roadways in the places where roads crossed natural drainages. A levy approximately 13,000 feet long parallel to Kelso Creek was found. The top of this levy is only five feet above natural ground and does not have the capacity to contain a 10-year flood. The levee has been breached several times since it was first built to protect a tract of 129 homes built in 1960. These floods have caused extensive damage to the levee itself, private property, and public roads, but no loss of life. This levee diverts stream flow from its natural course, depositing silt onto
downstream lands. The Kern County Water Agency determined that levee improvements offering increased levels of protection would be very expensive, with costs of levee construction exceeding the value of properties the improvements would protect.

Other existing flood control measures include: storm water retention impoundment located in the eastern portion of Lake Isabella; and a drainage easement in Mountain Mesa to handle runoff from Cook Peak as well as other dedicated easements in the South Fork Area. The Kern County Engineering, Surveying and Permit Services Department indicates that other major flood control structures or devices maintained by Kern County are located throughout the Specific Plan Area.

**Flood Zones**

To evaluate the potential for flooding in the Specific Plan Area, Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) maps and the County of Kern Geographic Information System, Division of Engineering and Surveying 2008 website were consulted to evaluate known 100-year and 500-year flood zones. This information is provided in Figure 4.8-2. As indicated in Figure 4.8-2, approximately 12,000 acres of the Specific Plan Area are located within 100-year and 500-year floodplains. These designations refer to flood events that are anticipated to occur, respectively, every 100 or 500 years, although such an event could occur at any time. Kern County utilizes these maps by applying the Kern County Floodplain Management Ordinance to all properties within the Zone A areas and the majority of the Zone X areas. No encroachment is allowed in Floodway areas. The FEMA FIRM maps and detailed information regarding the map designations are provided in Technical Appendix F to this EIR.

In addition, the State of California Department of Water Resources Division of Flood Management published a series of 25 maps, dated November 19, 1981, for the “designated floodway” along the North and South Forks of the Kern River above the Isabella Reservoir, which closely corresponds to 100-year flood zone in the 2008 FEMA FIRM and Kern County flood zone maps. While the designated floodway generally corresponds to the 100-year flood zones, there are variances and Smith-Gutcher and Associates, Inc. recommends that these maps be reviewed by project proponents during the planning stages.

**Isabella Dam Failure Inundation**

Isabella Dam (main dam and auxiliary dam) can hold 568,000 acre-feet of water in Isabella Reservoir. The dam, which is earth-filled, is approximately 185 feet high and 1,725 feet long and is built near the Kern Canyon Fault. If an earthquake were to occur in the vicinity, it could result in a break in the dam. This could cause the entire lake storage to be released and failure of Isabella Dam could potentially result in inundation of portions of the Hot Springs Valley located southwest of the dam, including most of the communities of Lake Isabella and Bodfish, and approximately 60 square miles of
Metropolitan Bakersfield. Figure 4.6-4 in Section 4.6, Geology and Soils, of this EIR indicates the portion of the Specific Plan Area that could be inundated due to failure of Isabella Dam during a seismic event. As a result of dam failure, flood levels in Metropolitan Bakersfield have the potential to reach 30 feet, depending on the water level in the reservoir at the time of the event. The Kern County General Plan indicates that the chances of the dam failing entirely, with the lake at capacity, was judged as one day in 10,000 years. Inundation due to failure of the Isabella Dam is considered a remotely possible event, given that the dam has been constructed to meet State standards and requirements and is subject to periodic inspection. However, the possibility of dam failure does exist. In response to this, Kern County and the ACOE have developed extensive emergency response plans that monitor the dam and will coordinate evacuation procedures upon indications of potential dam failure.

In addition, on April 27, 2006, the ACOE implemented a pool restriction at Isabella Reservoir after finding and studying a seepage concern near the auxiliary dam during an ongoing seismic investigation. The pool restriction will stay in effect until permanent corrective actions can be designed and constructed. The dam is currently considered to be safe by the ACOE, and the ACOE is taking actions to ensure this. The ACOE is coordinating its actions with local water users and resource management agencies.1 These actions are discussed below.

As a safety-oriented organization, the ACOE is focused on protecting people and property from flood events. To ensure the safe operation of the Isabella Dams (the main dam and the auxiliary dam) and the ability to respond to an emergency, ACOE officials have implemented several measures. They include:

- Lowering the lake to relieve pressure on the dam. This pool restriction will be 20 feet below full pool or 2585.5 feet. The recommended capacity of the reservoir is approximately 63 percent full. Measuring devices called piezometers indicate that the pressure on the dam has decreased as the water level has come down;
- Installing additional piezometers so that the ACOE can detect any signs of increased seepage or water pressure that might indicate a worsening condition;
- Increasing the reading of the piezometers from monthly to daily;
- Conducting daily dam inspections to monitor the normal above ground seepage and to look for other potential problems;
- Installing auto-dialer technology that will automatically call ACOE and other emergency contacts if the dam experiences a seismic event at a certain threshold;
- Stockpiling erosion control materials at the dam site;
- Identifying local emergency contractors who can react quickly to an immediate need for personnel and equipment to place erosion control material;
- Testing the backup communications systems; and
- Conducting Dam Safety courses with ACOE and USFS personnel.

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In addition, the ACOE has the ability to activate their Emergency Operations Center and work with the State and local emergency response agencies to provide 24/7 notification and coordination during a flood event.

4.8.3 REGULATORY SETTING

There are federal and State regulatory requirements that address hydrology and water quality. The following is a discussion of the regulatory requirements that would be a consideration in planning and development in the Specific Plan Area.

Federal

Clean Water Act

The Clean Water Act (CWA) is the primary federal regulation that governs water pollution. The CWA established a national policy to help maintain and restore the physical, chemical, and biological integrity of the nation’s waters. The principal body of law currently in effect is based on the Federal Water Pollution Control Amendments of 1972 which significantly strengthen the CWA. The 1972 act introduced a permit system for regulating point sources of pollution. In California, the California State Water Resources Control Board (SWRCB) assumes responsibility for implementing the CWA. The Specific Plan Area is under the jurisdiction of the California Regional Water Quality Control Board - Central Valley Region (Central Valley RWQCB).

National Pollutant Discharge Elimination System

To achieve its objectives, the CWA is based on the concept that all discharges into the nation’s waters are unlawful, unless specifically authorized by a permit. To address this, in 1972, the CWA established the National Pollutant Discharge Elimination System (NPDES) permit program to regulate the discharge of pollutants from “point sources” to waters of the nation (Waters of the U.S.). Industrial and municipal discharges (point source discharges) must obtain NPDES permits from the Central Valley RWQCB. The existing NPDES (Phase 1) stormwater program requires municipalities serving more than 1,000,000 persons to obtain a NPDES stormwater permit for any construction project larger than five acres. Proposed NPDES stormwater regulations (Phase II) expand this existing national program to small municipalities with populations of 10,000 persons or more and construction sites that disturb greater than one acre. For other discharges, such as those affecting groundwater or from non-point sources, a Report of Waste Discharge must be filed with the RWQCB. For specified situations, some permits may be waived and some discharge activities may be handled through inclusion in an existing general permit.
Although the EPA has two permitting options to meet the NPDES requirements (individual permits and general permits), the SWRCB has elected to adopt one statewide General Permit for California that applies to all construction-related stormwater discharges, except for those on tribal lands, in the Lake Tahoe Hydrologic Unit, and under the control of the California Department of Transportation (Caltrans). Construction subject to the statewide General Permit includes any clearing, grading, stockpiling, or excavation that results in soil disturbances of at least one acre of total land area. Construction activities disturbing less than one acre are still subject to this permit if the activity is part of a large common plan of development or if significant water quality impairment will result from the activity.

The General Permit requires all dischargers whose construction activity disturbs one acre or more to:

- Develop and implement a Storm Water Pollution Prevention Plan (SWPPP) that specifies Best Management Practices (BMPs) to prevent all construction pollutants from contacting stormwater and with the intent of keeping all products of erosion from moving off-site into receiving waters;
- Eliminate or reduce nonstormwater discharge to storm sewer systems; and
- Inspect all BMPs.

**Storm Water Pollution Prevention Plan**

The SWPPP has two major objectives: to help identify the source of sediment and other pollutants that affect the quality of storm water discharges; and to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in both stormwater and in nonstormwater discharges.

BMPs include activities, practices, maintenance procedures, and other management practices that reduce or eliminate pollutants in stormwater discharges and authorized nonstormwater discharges. BMPs include treatment requirements, operation procedures, and practices to control site runoff, spillage, leaks, waste disposal, and drainage from raw materials storage. BMP implementation must take into account changing weather conditions and construction activities, and various combinations of BMPs may be used over the life of the project to maintain compliance with the CWA. The General NPDES Permit gives the owner the discretion to determine the most economical, effective, and innovative BMPs to achieve the performance-based goals of the General NPDES Permit.

There are two types of BMPs: structural and nonstructural. Structural BMPs are the specific construction, modification, operation, maintenance, or monitoring of facilities that would minimize the introduction of pollutants into the drainage system or would remove pollutants from the drainage system. Nonstructural BMPs are activities, programs, and other nonphysical measures that help reduce pollutants from nonpoint sources to the drainage system. In general, nonstructural BMPs are source control measures.
State

Impaired Water Bodies
The CWA Section 303(d) and the California’s Porter-Cologne Water Quality Control Act require the State to establish the beneficial uses of its State waters and to adopt water quality standards to protect those beneficial uses. Section 303(d) establishes a Total Maximum Daily Load (TMDL), which is the maximum quantity of a particular contaminant that a water body can maintain without experiencing adverse effects, to guide the application of State water quality standards. Section 303(d) also requires the State to identify “impaired” streams (water bodies affected by the presence of pollutants or contaminants) and to establish the TMDL for each stream.

Porter-Cologne Water Quality Control Act
The Porter-Cologne Water Quality Control Act is the cornerstone of water protection law in California. This Act, in cooperation with the CWA, establishes the SWRCB. The SWRCB is divided into regions, each overseen by a Regional Water Quality Control Board (RWQCB). The SWRCB’s mandate is to balance, to the extent possible, all uses (domestic, agricultural, or environmental) of California’s water resources. As discussed above, the Specific Plan Area is under the jurisdiction of the Central Valley RWQCB.

The Porter-Cologne Water Quality Control Act develops Basin Plans that designate the beneficial uses of California’s rivers and groundwater basins. The Basin Plans also establish narrative and numerical water quality objectives for those waters. Basin Plans are updated every three years and provide the basis of determining waste discharge requirements, taking enforcement actions, and evaluating clean water grant proposals. The Porter-Cologne Water Quality Control Act is also responsible for implementing CWA Sections 401 – 402 and 303(d) through the SWRCB and the RWQCBs.

California Code of Regulations
California Code of Regulations Title 23, Water, and Title 27, Environmental Protection, provide regulations for water quality in the State. Regulations include the Environmental Water Act of 1989, rights to use water, waste discharge reports and requirements, discharges of waste to land, and underground tank regulations for new and existing tanks.

Cobey-Alquist Floodplain Management Act
The Cobey-Alquist Flood Plain Management Act (Water Code 8400-8415) discusses: the review of flood plain management plans; the establishment of flood plain regulations; and the regulations of designated floodway use and reimbursement costs for federal flood control project lands, easements, and right-of-ways.
Local

The following provides a discussion of the local regulatory requirements and guidelines that would be a consideration in planning and development in the Specific Plan Area.

Kern County General Plan

The General Plan is a policy document with planned land use maps and related information designed to provide long-range guidance to County officials making decisions affecting development and the resources of the unincorporated Kern County jurisdiction, excluding the Metropolitan Bakersfield planning area. The General Plan helps to ensure that day-to-day decisions conform with long-range policies designed to protect and further the public interest related to the County’s growth and development. The General Plan was updated and approved on June 15, 2004 by the Board of Supervisors.

The General Plan Land Use Map provides the following Physical and Environmental Constraints map codes related to hydrology and water quality:

- Map Code 2.3 (Shallow Groundwater) - Groundwater within 15 feet of the land surface is delineated on the Kern County Seismic Hazard Atlas.

- Map Code 2.5 (Flood Hazard) - Special Flood Hazard Areas (Zone A), as identified on the Flood Insurance Rate Maps (FIRM) of the Federal Emergency Management Agency (FEMA) and supplemented by floodplain delineating maps that have been approved by the Kern County Engineering and Survey Services Department.

The General Plan Land Use Map provides the following Public Facilities and Services map code related to hydrology and water quality:

- Map Code 3.3 (Other Facilities) – Existing facilities used for public or semi-public services. Permitted uses include, but are not limited to, airports, sewer farms, treatment plans, and water spreading areas.

The General Plan Land Use, Open Space, and Conservation Element provides the following relevant goals, policies, and implementation measures related to hydrology and water quality:

Goal: Physical and Environmental Constraints

1. To strive to prevent loss of life, reduce personal injuries, and property damage, minimize economic and social diseconomies resulting from natural disaster by directing development to areas which are not hazardous.
Policies: Physical and Environmental Constraints

1. Kern County will ensure that new developments will not be sited on land that is physically or environmental constrained (Map Code 2.1 (Seismic Hazard), Map Code 2.2 (Landslide), Map Code 2.3 (Shallow Groundwater), Map Code 2.5 (Flood Hazard), Map Codes from 2.6 – 2.9, Map Code 2.10 (Nearby Waste Facility), and Map Code 2.11 (Burn Dump Hazard)) to support such development unless appropriate studies establish that such development will not result in unmitigated significant impact.

2. In order to minimize risk to Kern County residents and their property, new development will not be permitted in hazard areas in the absence of implementing ordinances and programs. These ordinances will establish conditions, criteria, and standards for the approval of development in hazard areas.

3. Zoning and other land use controls will be used to regulate and, in some instances, to prohibit development in hazardous areas.

8. Encourage the preservation of the floodplain’s flow conveyance capacity, especially in floodways, to be open space/passive recreation areas throughout the County.

9. Construction of structures that impede water flow in a primary floodplain will be discouraged.

10. The County will allow lands which are within flood hazard areas, other than primary floodplains, to be developed in accordance with the General Plan and Floodplain Management Ordinance, if mitigation measures are incorporated so as to ensure that the proposed development will not be hazardous within the requirements of the Safety Element (Chapter 4) of this General Plan.

11. Protect and maintain watershed integrity within Kern County.

Implementation Measures: Physical and Environmental Constraints

C. Cooperate with the Kern County Water Agency to classify lands in the County overlying groundwater according to groundwater quantity and quality limitations.

F. The County will comply with the Cobey-Alquist Floodplain Management Act in regulating land use within designated floodways.

G. Continue to identify areas in which the Kern County Engineering and Survey Services Department should initiate studies for flood hazard where studies have not previously been made and for which urban development is proposed.

H. Development within areas subject to flooding, as defined by the appropriate agency, will require necessary flood evaluations and studies.
I. Designated flood channels and water courses, such as creeks, gullies, and riverbeds, will be preserved as resource management areas or in the case of urban areas, as linear parks whenever practical.

J. Compliance with the Floodplain Management Ordinance prior to grading or improvement of land for development or the construction, expansion, conversion or substantial improvements of a structure is required.

N. Applicants for new discretionary development should consult with the appropriate Resource Conservation District and the California Regional Water Quality Control Board regarding soil disturbances issues.

O. The Kern County Engineering and Survey Services Department should perform, as funding permits, additional floodplain studies to better define the extent of flood-prone areas in order to ensure compatibility with future land use.

Goals: Public Facilities and Services

5. Ensure that adequate supplies of quality (appropriate for intended use) water are available to residential, industrial, and agricultural uses within Kern County.

9. Serve the needs of industries and Kern County residents in a manner that does not degrade the water supply and the environment and protect the public health and safety by avoiding surface and subsurface nuisances resulting from the disposal of hazardous wastes, irrespective of the geographic origin of the waste.

11. Reduce residential contamination of groundwater by encouraging sanitary sewer systems.

Policies: Public Facilities and Services

1. New discretionary development will be required to pay its proportional share of the local costs of infrastructure improvements required to service such development.

2. The efficient and cost-effective delivery of public services and facilities will be promoted by designating areas for urban development which occur within or adjacent to areas with adequate public service and facility capacity.
   a. Ensure that water quality standards are met for existing users and future development.
   b. Ensure that adequate storage, treatment, and transmission facilities are constructed concurrently with planned growth.
   c. Ensure the maintenance and repair of existing water systems.
   d. Encourage the utilization of wastewater treatment facilities which provide for the reuse of wastewater.
   e. Encourage the consolidation or elimination of small water systems.
f. Encourage the conversion of private sewer systems (septic tanks) to public systems.

Implementation Measure: Public Facilities and Services

K. The appropriate agency should develop sewer and water master plans in areas where these services are lacking or deficient and in areas where urban development exists or is designated.

Goal: Resource

1. To contain new development within an area large enough to meet generous projections of foreseeable need, but in locations which will not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources, or diminish the other amenities which exist in the County.

Policies: Resource

10. To encourage effective groundwater resource management for the long-term economic benefit of the County the following shall be considered:
   a. Promote groundwater recharge activities in various zone districts.
   b. Support for the development of Urban Water Management Plans and promote Department of Water Resources grant funding for all water providers.
   c. Support the development of groundwater management plans.
   d. Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater, and desalination.

11. Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood protection ordinances.

20. Areas along rivers and streams will be conserved where feasible to enhance drainage, flood control, recreational, and other beneficial uses while acknowledging existing land use patterns.

Implementation Measures: Resource

C. The County Planning Department will seek review and comment from the County Engineering and Survey Services Department on the implementation of the National Pollution Discharge Elimination System for all discretionary projects.

D. The minimum lot size requirements of the A Zone District shall provide for the creation of homesite parcels consistent with the density required of the General Plan designations.
E. Designate the riparian community abutting rivers and streams with an appropriate resource use (e.g. Map Code 8.2 (Resource Reserve), Map Code 8.3 (Extensive Agriculture), or Map Code 8.5 (Resource Management)) or resource management designation where feasible to do so.

Goals: General Provisions

1. Ensure that the County can accommodate anticipated future growth and development while maintaining a safe and healthful environment and a prosperous economy by preserving valuable natural resources, guiding development away from hazardous areas, and assuring the provision of adequate public services.

Policies: General Provisions - Public Services and Facilities

12. All methods of sewage disposal and water supply shall meet the requirements of the Kern County Environmental Health Services Department and the California Regional Water Quality Control Board. The Environmental Health Department shall periodically review and modify, as necessary, its requirements for sewage disposal and water supply, and shall comply with any new standards adopted by the State for implementation of Government Code Division 7 of the Water Code Chapter 4.5 (Section 13290-13291-7). (Assembly Bill 855)(2000).

17. The extent of community-type public services and facilities required for urban densities in the Mountain, Valley, and Desert regions vary according to the following criteria:
   a. Within the Valley and Desert regions, new residential development sites less than or equal to one acre net lot size density, commercial, and industrial land uses shall be serviced by necessary and appropriate sewer and water systems.
   b. Within the Mountain Region, new residential development sites less than or equal to 2½ acres gross lot size density, commercial, and industrial land uses shall be serviced by necessary and appropriate sewer and water systems.

Implementation Measures: General Provisions – Public Services and Facilities

D. The appropriate agency should develop sewer and water master plans in areas where these services are lacking or deficient and in areas where urban development exists or is designated. Seek non-local sources of funding for implementing capital improvement plans.

E. All new discretionary development projects shall be subject to the Standards for Sewage, Water Supply, and Preservation of Environmental Health Rules and Regulations administered by the Environmental Health Services Department. Those projects having percolation rates of less than five minutes per inch shall provide a preliminary soils study and site specific documentation that characterizes the quality of upper groundwater in the project vicinity and evaluation of the extent to which, if any, the proposed use of alternative septic
systems will adversely impact groundwater quality. If the evaluation indicates that the uppermost groundwater at the proposed site already exceeds groundwater quality objectives of the Regional Water Quality Control Board or would if the alternative septic system is installed, the applicant shall be required to supply sewage collection, treatment and disposal facilities.

Policies: General Provisions - Surface Water and Groundwater

34. Ensure that water quality standards are met for existing users and future development.

35. Ensure that adequate water storage treatment, and transmission facilities are constructed concurrently with planned growth.

39. Encourage the development of the County’s groundwater supply to sustain and ensure water quality and quantity for existing users, planned growth, and maintenance of the natural environment.

40. Encourage utilization of community water systems rather than the reliance on individual wells.

41. Review development proposals to ensure adequate water is available to accommodate projected growth.

42. Encourage water supply purveyors to prepare master water plans for those areas of the County approaching existing design thresholds, including documentation of areas in need of system maintenance and repair.

43. Drainage shall conform to the Kern County Development Standards and the Grading Ordinance.

44. Discretionary projects shall analyze watershed impacts and mitigate for construction-related and urban pollutants, as well as alterations of flow patterns and introduction of impervious surfaces as required by the California Environmental Quality Act (CEQA), to prevent the degradation of the watershed to the extent practical.

45. New high consumptive water uses, such as lakes and golf courses, should require evidence of additional verified sources of water other than local groundwater. Other sources may include recycled stormwater or wastewater.

Implementation Measures: General Provisions - Public Services and Facilities

U. The Kern County Environmental Health Services Department will develop guidelines for the protection of groundwater quality which will include comprehensive well construction standards and the promotion of groundwater protection for identified degraded watersheds.
V. Water and sewer purveying agencies should develop long-term sewer and water master plans in areas where these services are lacking or deficient and in areas where urban development exists or is designated.

W. Applications for General or Specific Plan Amendments will include sufficient data for review to facilitate desirable new development proposals consistent with General Plan policies, using the following criteria and guidelines:
   i. The provision of adequate water, sewer, and other public services to be used.
   ii. The provision of adequate on-site nonpublic water supply and sewage disposal if no public systems are available or used.

X. Encourage effective groundwater resource management for the long-term benefit of the County through the following:
   i. Promote groundwater recharge activities in various zone districts.
   ii. Support for the development of Urban Water Management Plans and promote Department of Water Resources grant funding for all water providers.
   iv. Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water, and groundwater and desalination.

Y. Promote efficient water use by utilizing measures such as:
   i. Requiring water-conserving design and equipment in new construction.
   ii. Encouraging water-conserving landscaping and irrigation methods.
   iii. Encouraging the retrofitting of existing development with water conserving devices.

Z. General Plan Amendments subject to environmental review and not otherwise subject to California Water Code Section 10910 shall demonstrate through a water supply assessment that a long-term water supply for a 20-year timeframe is available. The water assessment shall include, but not limited to, the following:
   i. Source and quantity of historical water use on the site.
   ii. Estimated water consumption of the proposed development.
   iii. Estimated storage, if any, in meeting the projected need.
   iv. Recommendations for additional sources of water to address demand shortage. Such measures may include, but not limited to, development of future sources of additional surface water and groundwater, including water transfers, conjunctive use, recycled water, conservation, and additional storage of surface water, groundwater, and desalination.
Written acknowledgement that water will be provided by a community or public water system with an adopted Urban Water Management Plan shall constitute compliance with this requirement.

The General Plan Safety Element provides the following relevant goals, policies, and implementation measures related to hydrology and water quality:

Goals
1. Minimize injuries and loss of life and reduce property damage.
2. Reduce economic and social disruption resulting from earthquakes, fire, flooding, and other geologic hazards by assuring the continuity of vital emergency public services and functions.
3. Assist in the allocation of public resources in Kern County to develop information regarding geologic, fire, and flood safety hazards and to develop a systematic approach toward the project of public health, safety, and welfare from such hazards.
4. Create an awareness of the residents in Kern County through the dissemination of information about geologic, fire, and flood safety hazards.

General Policies
1. That the County’s program of identification, mapping, and evaluating the geologic, fire, flood safety hazard areas, and significant concentrations of hydrogen sulfide in oilfield areas, presently under way by various County departments, be continued.
3. That the County government encourage public support of local, State, and federal research programs on geologic, fire, flood hazards, valley fever, plague, and other studies so that acceptable risk may be continually reevaluated and kept current with contemporary values.
4. The County shall encourage extra precautions be taken for the design of significant lifeline installations, such as highways, utilities, and petrochemical pipelines.

General Implementation Measures
A. All hazards (geologic, fire, and flood) should be considered whenever a Planning Commission or Board of Supervisor’s action could involve the establishment of a land use activity susceptible to such hazards.
4.8 Hydrology and Water Quality

C. Require detailed site studies for ground shaking characteristics, liquefaction potential, dam failure inundation, flooding potential, and fault rupture potential as background to the design process for critical facilities under County discretionary approval.

F. The adopted multi-jurisdictional Kern County, California Multi-Hazard Mitigation Plan, as approved by FEMA, shall be used as a source document for preparation of environmental documents pursuant to CEQA, evaluation of project proposals, formulation of potential mitigation, and identification of specific actions that could, if implemented, mitigate impacts from future disasters and other threats of public safety.

Policies: Dam Failures, Flooding, and Inundation

1. Design discretionary critical facilities located within the potential inundation area for dam failure in order to mitigate the effects of inundation on the facility; promote orderly shutdown and evacuation (as appropriate); and prevent on-site hazards from affecting building occupants and the surrounding communities in the event of dam failure.

2. Design discretionary critical facilities in the potential dam inundation area used for the storage, or use of hazardous materials to prevent on-site hazards from affecting surrounding communities in the event of inundation.

3. Require emergency response plans for the planning area to include specific procedures for the sequential and orderly evacuation of the potential dam inundation area.

4. Encourage critical and high occupancy facilities as well as facilities for the elderly, handicapped, and other special care occupants, located in the potential inundation area below the dam to develop and maintain plans for the orderly evacuation of their occupants.

Implementation Measures: Dam Failures, Flooding, and Inundation

A. Facilities used for the manufacture, storage, and use of hazardous materials shall comply with the Uniform Fire Code, with requirements for siting or design to prevent on-site hazards from affecting surrounding communities in the event of inundation.

B. Discretionary critical facilities within potential inundation areas shall be designed to mitigate or prevent effects of inundation.

Kern County Floodplain Management Ordinance

The County’s Floodplain Management Ordinance requires that all development be reviewed for compliance with necessary flood protection regulations intended for the protection of life and property.
Kern County Zoning Ordinance

The Kern County Zoning Ordinance provides zoning districts that address land within the floodplain. These zoning districts are described below.

Kern County Floodplain Primary District (Chapter 19.50)

The purpose of the Floodplain Primary (FPP) District is to protect the public health and safety and minimize property damage by designating areas that are subject to flooding with high velocities or depths and by establishing reasonable restrictions on land use in such areas. The FPP District shall be applied to those areas lying within the “Floodway” as shown on the Flood Boundary Floodway Map (FBFM) or within the “Designated Floodway” on the State of California’s Board of Reclamation’s Kern River Designated Floodway Studies, or other maps where engineering studies have been made and adopted by the Kern County Board of Supervisors. Uses in the FPP District are limited to those low intensity uses not involving buildings, structures, and other activities that might adversely affect or be adversely affected by flow of water in the floodway.

Kern County Floodplain Combining District (Chapter 19.70)

The purpose of the Floodplain (FP) Combining District is to protect the public health and safety and minimize property damage by designating areas that are potentially subject to flooding and by establishing reasonable restriction on land use in such areas. The FP Combining District is applied to those areas lying within Zone A on the Flood Insurance Maps (FIRM) or those areas potentially subject to flooding as designated by the Kern County Engineering, Surveying and Permit Services Department pending reclassification of such areas into the FPP District or the Floodplain Secondary (FPS) Combining District. The regulations established by the FP Combining District shall be in addition to the regulations of the base district with which the FP Combining District is combined.

Kern County Floodplain Secondary Combining District (Chapter 19.72)

The purpose of the FPS Combining District is to protect the public health and safety and minimize property damage by designating areas that are subject to flooding with relatively low velocities or depths and by establishing reasonable restrictions on land use in such areas. The FPS Combining District shall be applied to those areas lying within special flood hazard areas designated as Zones AO and AH, and Zone A1 A30 on the FIRM Maps, but excluding the floodway on the FBFM Maps, the Designated Floodway on the State of California's Board of Reclamation's Kern River Designated Floodway Studies, or other maps where engineering studies have been made and adopted by the County Board of Supervisors. The regulations established by the FPS Combining District shall be in addition to the regulations of the base district with which the FPS Combining District is combined.
Kern County Multi-Hazard Mitigation Plan

The purpose of the Kern County Multi-Hazard Mitigation Plan (2005) is to reduce or eliminate long-term risk to people and property from natural hazards including fire and their effects in the County. This plan was prepared to meet the Disaster Mitigation Act of 2000 requirements in order to maintain the County’s eligibility for FEMA Pre-Disaster Mitigation (PDM) and Hazard Mitigation Grant Programs (HMGP). This plan lays out the strategy that will enable the County to become less vulnerable to future disaster losses.

4.8.4 IMPACTS

Impacts 4.8 Would the Proposed Project Result in Impacts Related to Hydrology and Water Quality Based on the Thresholds of Significance Identified Below?

Methodology

The potential impacts related to hydrology and water quality associated with the proposed project were evaluated on a quantitative and qualitative basis. The evaluation of the impacts of the proposed project is based on professional judgment, the significance criteria established by CEQA and the County, and an analysis of the Kern County General Plan goals and policies related to hydrology and water quality.

Thresholds of Significance Impact Criteria

The Kern County CEQA Implementation Document and the Kern County Environmental Checklist state that a proposed project could potentially have a significant impact if it would:

- 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 site 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 site or off site;

- 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;
4.8 Hydrology and Water Quality

- Otherwise substantially degrade water quality;

- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;

- Place within a 100-year flood hazard area structures which would impede or redirect flood flows;

- Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam; or

- Inundation by seiche, tsunami, or mudflow.

Kern River Valley Specific Plan

Chapter 3.0, Project Description, of this EIR provides a description of the proposed project, which consists of the implementation of the Specific Plan. The Specific Plan establishes planning goals, policies, and implementation measures to guide the future land uses and development of the Plan Area to the year 2030 to expand and enhance the community’s unique business and tourism resources, while conserving existing environmental resources. Figure 3-3 in Chapter 3.0, Project Description, of this EIR provides the Specific Plan Land Use Map, which identifies the proposed land use distribution within the Specific Plan Area.

Land Use Element

The Specific Plan Land Use Element provides the following goal, policies, and implementation measures related to hydrology and water quality:

General Land Use Goal

Goal 2.1.5: Promote land use and development that results in sustainable use and conservation of the Valley’s resources.

General Land Use Policies

Policy 2.1.4: Support efforts of State and federal agencies and private conservation organizations to acquire properties for open space, flood control and conservation benefit.

Policy 2.1.13: New residential, commercial and industrial development shall be sited in a manner to minimize the adverse effects of physical constraints (flooding, access, water quality, seismic, steep slopes, etc.) and provide emergency response to enhance public safety.
General Land Use Implementation Measures

Implementation 2.1.11: The County will support public agencies, nonprofit organizations, and tribal organizations who apply for Sierra Nevada Conservancy grants or loans, which will advance one or more of the following Conservancy goals:

a. Provide increased opportunities for tourism and recreation.

b. Protect, conserve, and restore the region’s physical, cultural, archaeological, historical, and living resources.

c. Aid in the preservation of working landscapes.

d. Reduce the risk of natural disasters, such as wildfires.

e. Protect and improve water and air quality.

f. Assist the regional economy through the operation of the conservancy’s program.

g. Undertake efforts to enhance public use and enjoyment of lands owned by the public.

h. Support efforts that advance both environmental preservation and the economic well being of Valley residents in a complementary manner.

Implementation 2.1.12: Areas with seismic, steep slope, flooding, high groundwater and other physical constraints shall be analyzed to minimize impacts to the environment, resources, and public safety as part of the development review process for discretionary land use projects.

Open Space and Recreation Element

The Specific Plan Open Space and Recreation Element provides the following goals, policies, and implementation measures related to hydrology and water quality:

Open Space/Watershed Management Goals

Goal 4.1.1: Protect and maintain water and related natural systems for all existing and future reasonable and beneficial uses within the South Fork Kern and Upper Kern watersheds.

Goal 4.1.2: Ensure future watershed management decisions incorporate all property owners including government agencies and private landowners.

Open Space/Watershed Policies

Policy 4.1.1: To the maximum extent possible, preserve existing wetlands and the hydrological systems that support them.
Policy 4.1.2: Explore partnerships and funding opportunities with existing agencies and organizations to work toward protecting the Valley’s watersheds.

Policy 4.1.3: Discretionary projects shall address watershed impacts and reduce impacts from construction-related activities, as well as alterations of flow patterns and introduction of impervious surfaces to prevent the degradation of the watershed as required by the National Pollution Discharge Elimination System (NPDES) permit.

Policy 4.1.4: Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood-protection ordinances and the National Pollution Discharge Elimination System (NPDES) permit.

Policy 4.1.5: Areas along rivers and streams will be conserved to enhance drainage, flood control, recreational, and other beneficial uses while acknowledging existing land use patterns.

Policy 4.1.6: All storm water drainage areas should be contained in natural drainage channels, and the grading of such channels and easements shall be kept to a minimum.

Policy 4.1.7: Promote conservation of stream buffers, forests, meadows, and other areas of watershed value.

Policy 4.1.8: Discretionary projects shall be consistent with watershed regulations as required by the U.S. Fish and Wildlife Service, California Department of Fish and Game, Regional Water Quality Control Board, Environmental Protection Agency, and the U.S. Army Corps of Engineers.

Policy 4.1.12: The use of voluntary Conservation Easements is recognized as a tool to protect watersheds, preserve open space and conserve agricultural lands within the Plan area.

Open Space/Watershed Management Implementation Measures

Implementation 4.1.2: All development shall comply with the requirements of the County’s grading, drainage, and flood protection ordinances.

Implementation 4.1.3: Except where germination is not feasible, side slopes of constructed drainage easements for discretionary projects must be reseeded with a native grass mixture at the minimum rate of 40 pounds per acre and properly fertilized and mulched, where deemed necessary or as recommended by the Natural Resources Conservation Service.
Implementation 4.1.4: To help protect the watershed, all discretionary projects should incorporate ways to reduce impervious areas and mitigate erosion.

Implementation 4.1.5: Collaborate with agencies and special interest organizations, such as the Kern Valley Resource Conservation District and the Kern River Valley Heritage Foundation, to form partnerships and seek funding opportunities to protect the Valley’s wetlands and watersheds.

Implementation 4.1.6: Collaborate with national, regional, and local conservation organizations and governmental agencies, to identify and acquire environmentally sensitive open space, and to protect watercourses and wildlife corridors through various mechanisms including the use of voluntary conservation easements that include appropriate land stewardship to protect downstream and adjacent properties.

Conservation Element

The Specific Plan Conservation Element provides the following goals, policies, and implementation measures related to hydrology and water quality:

Water Conservation Goals

Goal 5.3.1: Maintain a balance between water supply and water consumption.

Goal 5.3.2: Promote the use of graywater systems as a means to conserve the area’s water supply.

Water Conservation Policies

Policy 5.3.1: New high consumptive water uses, such as lakes and golf courses, should require evidence of additional verified sources of water other than local groundwater. Other sources may include recycled stormwater or wastewater.

Policy 5.3.2: Encourage utilization of wastewater treatment facilities which provide for the reuse of wastewater.

Policy 5.3.3: Encourage water conservation, including landscaping with drought-tolerant plants, use of reclaimed water (graywater), and recycling of cooling system water, in all development.

Policy 5.3.4: Educate the public about the importance of water conservation.

Policy 5.3.5: Support expanded use of reclaimed water for both new development and existing development retrofits to conserve the area’s water supply.
Policy 5.3.6: Encourage drainage designs which retain or detain stormwater run-off to minimize volume and pollutant concentrations.

Policy 5.3.7: Develop a regional approach to resolve water supply issues in the Kern River Valley.

Policy 5.3.8: Encourage the use of graywater systems both in new construction and in the retrofit of existing buildings as a means to conserve the area’s water supply.

Water Conservation Implementation Measures

Implementation 5.3.1: Work with the water entities to require water conservation and ultimately reduce the demand for peak-hour water supply and wastewater capacity.

Implementation 5.3.2: Promote the development of an areawide Groundwater Management Plan which include multiple water entities for which water supply and quality issues have arisen. These Plans should include water conservation measures which will be applied to existing and future consumers. Options for funding programs with loans and grants may be available through the State of California Department of Health Services.

Implementation 5.3.3: Continue conservation efforts and actively pursue water storage and source alternatives, including dry year water transfer options, and use and production of reclaimed water.

Implementation 5.3.4: Review the County’s adopted Code of Building Regulations, and require the use of water conservation measures to reduce water consumption. Such measures may include, but are not limited to, the use of plumbing fixtures that reduce water use, low-flow toilets, drip irrigation systems, landscaping that maximizes use of drought-tolerant plant species, and graywater systems both in new construction and in the retrofit of existing land uses.

Implementation 5.3.5: Use reclaimed water and drainage designs that incorporate swales for new County developments, and provide information at County facilities highlighting these techniques.

Implementation 5.3.6: The County will promote efficient water use by utilizing measures such as:

a. Requiring water-conserving design and equipment in new construction.

b. Encouraging water-conserving landscaping and irrigation methods.
4.8 Hydrology and Water Quality

c. Encouraging the retrofitting of existing development with water conserving devices.

Implementation 5.3.7: The Planning Department will develop a xeriscape landscaping program within two years of plan adoption in order to implement landscaping requirements as part of the Precise Development requirements.

Implementation 5.3.8: Promote education programs that increase the awareness of firewise, waterwise and native plants as alternatives to conventional landscaping.

Implementation 5.3.9 Promote the Kern River Valley Watershed Conservation Programs of the Mojave Desert Mountain Resource Conservation and Development Council.

Safety Element

The Specific Plan Public Safety Element provides the following goals, policies, and implementation measures related to hydrology and water quality:

Flooding and Dam Inundation Goal

Goal 6.2.1: Prevent loss of life, reduce personal injuries and property damage, and minimize economic loss resulting from flood hazard, and dam inundation conditions.

Flooding and Dam Inundation Policies

Policy 6.2.1: Facilitate public education regarding inundation hazards associated with Isabella Dam shown in Figure 6-3, and work with the U.S. Army Corps of Engineers and the Kern County Fire Department to develop evacuation and disaster plans.

Policy 6.2.2: Prohibit incompatible uses in primary floodway areas.

Policy 6.2.3: Minimize the alteration of primary floodways, stream channels, and natural protective barriers that accommodate or channel floodwaters.

Policy 6.2.4: Maintain primary floodway’s flow conveyance capacities by preserving open space and recreation areas within the floodways.

Policy 6.2.5: Consider development of a master drainage plan for those areas of the Valley that will support future development.
4.8 Hydrology and Water Quality

Policy 6.2.6: Minimize the potential for damage from floods by protecting and restoring the natural water storage and conveyance functions of primary floodways giving preference wherever possible to non-structural surface water management methods.

Policy 6.2.7: Construction of structures in the primary floodway that obstruct the natural flow of water is prohibited.

Policy 6.2.8: On existing lots of record, all structures along with all attendant utilities shall be located outside the primary floodplain. If no site is available outside the primary floodplain, construction shall be consistent with Federal Emergency Management Agency and Kern County Engineering, Surveying and Permit Services Department requirements and will require a Conditional Use Permit in the Floodplain Primary (FPP) District.

Flooding and Dam Inundation Implementation Measures

Implementation 6.2.1: Require flood studies as part of discretionary permit application and site plan review within areas designated Map Code 2.5 (Flood Hazard) on the Physical and Environmental Constraints Map (Figure 6-1), and as required by the Kern County Engineering, Surveying and Permit Services Department.

Implementation 6.2.2: The Kern County Engineering, Surveying and Permit Services Department may require a flood study for discretionary projects located within a flood hazard area. Mitigation measures which may be considered include:

a. Raising the lowest floor elevations to be at least one-foot above the primary floodplain level.

b. Minimize or prohibit man-made levees or other channelization improvements that alter the natural flow within the primary floodplain.

c. Reduction of impervious surfaces.

Implementation 6.2.3: Plan and build drainage facilities following applicable Kern County standards and California Environmental Quality Act (CEQA) procedures, to avoid impact on natural habitat areas.

Implementation 6.2.4: The Kern County Fire Department Office of Emergency Services shall work with the Army Corps of Engineers to develop appropriate emergency plans for the safe evacuation of occupants of areas subject to possible inundation from failure of Isabella Dam and natural flooding.
4.8 Hydrology and Water Quality

Implementation 6.2.5  Undertake analysis of floodplain management practices on the South Fork of the Kern River and devise programs that promote cooperative efforts by private and public property owners to protect the flood carrying capacity and minimize siltation.

Shallow Groundwater Goal

Goal 6.3.1:  Ensure public health and safety risks associated with shallow groundwater have been minimized to the greatest extent possible as well as protect the groundwater quality.

Shallow Groundwater Policy

Policy 6.3.2:  This Plan’s Physical and Environmental Constraints Map shall provide the most up to date information on the location of shallow groundwater areas. Subsequent shallow groundwater studies performed by a qualified hydrologist shall be incorporated within this map.

Shallow Groundwater Implementation Measures

Implementation 6.3.1:  Require preparation of groundwater studies for all discretionary development within areas designated as Map Code 2.3 (Shallow Groundwater) on the Physical and Environmental Constraints Map, and impose conditions, as needed, to guard against potential public safety and health risks.

Implementation 6.3.2:  Seek funding to further study and define the potential for shallow groundwater in a portion of the South Fork area, and amend this Specific Plan as needed to incorporate the new information.

Public Facilities and Services Element

The Specific Plan Public Facilities and Services Element provides the following goals, policies, and implementation measures related to hydrology and water quality:

Sewage and Septic System Goal

Goal 9.1.1:  Ensure that wastewater disposal systems adequately protect the health and safety of all Kern River Valley residents and businesses, and groundwater is protected.

Sewage and Septic System Policies

Policy 9.1.1:  Community sewage treatment and disposal facilities with collection systems will be required for all new developments of 25 or more lots
proposed as one development or cumulatively with other new developments in a community area, unless soils engineering studies performed at the time of any land division project, and approved by the Kern County Environmental Health Services Department, indicate that alternative septic systems, either individual or community design, are equal to or better than a community collection, treatment, and disposal system.

Policy 9.1.3: New development projects (residential, commercial, and industrial) shall be serviced by appropriate wastewater disposal and water systems as approved by the Kern County Environmental Health Services Department.

Policy 9.1.4 To reduce water consumption and groundwater pollution, encourage the use of alternative septic systems (aerobic, waterless and graywater-separation systems) as permitted by the Building Code and approved by the Environmental Health Services Department

Sewage and Septic System Implementation Measures

Implementation 9.1.1: The County should explore the feasibility of developing sewer master plans and funding programs for areas of urban density which continually experience septic system failures.

Implementation 9.1.3: All new discretionary development projects shall be subject to the Standards for Sewage, Water Supply and Preservation of Environmental Health Rules and Regulations administered by the Kern County Environmental Health Services Department. Projects having percolation rates of less than five minutes per inch shall provide a preliminary soils study and site specific documentation that characterizes the quality of upper groundwater in the project vicinity, and an evaluation of the extent to which, if any, the proposed use of alternative septic systems will adversely impact groundwater quality. If the evaluation indicates that the uppermost groundwater at the proposed site already exceeds groundwater quality objectives of the Regional Water Quality Control Board, or would if the alternative septic system is installed, the applicant shall be required to supply sewage collection, treatment and disposal facilities.

Water Supply and Distribution Goal

Goal 9.2.1: Support affordable coordinated, comprehensive, and reliable water supply systems and facilities capable of meeting both normal and dry year water demands.
Water Supply and Distribution Policies

Policy 9.2.1: Ensure that water purveyors provide sufficient water storage, treatment, and transmission facilities to meet the existing and projected water needs of the Kern River Valley, while emphasizing conservation goals.

Policy 9.2.2: Encourage cooperation and coordination among the various water purveyors in the Kern River Valley to ensure affordable and adequate water supply and quality.

Policy 9.2.3: Encourage the combining of small water systems, including coordination of groundwater resource usage, to provide adequate community, domestic, and agricultural water needs.

Policy 9.2.4: In accordance with the Kern County Development Standards, tank-truck hauling of domestic water for land developments or lots within new land developments shall not be permitted.

Policy 9.2.5: Water-related infrastructure shall be provided in an efficient and cost-effective manner that ensures maintenance and repair of existing water systems.

Policy 9.2.6: Water municipalities or companies which service more than 3,000 customers or deliver more than 3,000 acre-feet annually should develop an Urban Water Management Plan. In accordance with Water Code Section 10617, “urban water suppliers” include those entities which are suppliers or contractors of water.

Policy 9.2.7: In accordance with the California Water Code, water purveyors whose supply depends on the groundwater in the Kern River Valley are encouraged to develop a Groundwater Management Plan, either individually or collectively.

Water Supply and Distribution Implementation Measures

Implementation 9.2.1: Specific Plan Amendments subject to environmental review and not otherwise subject to California Water Code Section 10910 shall demonstrate through a water supply assessment that a long-term water supply for 20-year timeframe is available. The water assessment shall include, but not be limited to, the following:

a. Source and quantity of historical water use on the site.

b. Estimated water consumption of the proposed development.

c. Estimated storage, if any, required to meet the projected need. “Projected need” includes water for fire fighting.
d. Recommendations for additional sources of water to address demand shortage. Such measures may include, but are not limited to, development of future sources of additional surface water and groundwater, including water transfers, conjunctive use, recycled water, conservation, additional storage of surface water, and groundwater.

Written acknowledgement that water will be provided by a community or public water system with an adopted Urban Water Management Plan shall constitute compliance with this requirement. As of 2005/2006, no water entities in the Kern River Valley, other than the California Water Services Company, have developed an Urban Water Management Plan.

**Water Quality Goal**

Goal 9.3.1: Protect and improve local groundwater quality.

**Water Quality Policies**

Policy 9.3.1: Ensure that water quality standards are met for existing and future users.

Policy 9.3.2: Support the efforts of water purveyors to cost-effectively expand and provide adequate water treatment facilities and achieve federal and State water quality standards.

Policy 9.3.3: Establish a coordinated effort to protect water quality by preventing further degradation of existing water resources and supply.

**Water Quality Implementation Measures**

Implementation 9.3.1: Prior to approval of any Specific Plan Amendment or subdivision approval, applicants shall provide information for review and approval by the Kern County Environmental Health Services Department regarding the sources, quality, and quantity of water to be supplied.

Implementation 9.3.2: In accordance with the Kern County Environmental Health Services Department standards, all development within 300 feet of a public water system shall be required to hook up to that water system. If the water system is not willing to service the proposed development then a water-well may be drilled. Nondomestic wells are allowed only in the Exclusive Agriculture (A) District.

Implementation 9.3.3: Water purveyors should develop long-term water master plans in areas where water resources are deficient in quality or quantity.
Implementation 9.3.4: The County shall consult with the appropriate regulatory agencies for the purpose of developing a Kern River Valley Water Preservation Committee. When established, the Kern River Valley Water Preservation Committee shall work towards creating and implementing a Sustainability Task Force. The purpose of the task force shall be to encourage a localized grass-roots effort to educate the public and identify local methods for sustaining growth and development throughout the Kern River Valley based on existing resources.

Sustainability Element

The Specific Plan Sustainability Element provides the following goals, policies, and implementation measures related to hydrology and water quality:

General Sustainability Goals

Goal 11.1.3: Encourage landscape design and maintenance and agricultural practices that reduce or eliminate the use of pesticides and herbicides, as well as conserving water.

Goal 11.1.4: Encourage forms of development, residential, business and agriculture that reduce water use, and employ innovative wastewater treatment processes that eliminate the use of chemicals (e.g., biofiltration).

General Sustainability Policies

Policy 11.1.3: Encourage the use of drought-tolerant, low-water-consuming landscaping as a means of reducing overall and per capita water demand.

Policy 11.1.4: Encourage the use of agricultural management practices that result in the efficient use of water resources.

Policy 11.1.5: Promote organic agriculture in order to minimize use of chemical pesticides and herbicides and to encourage agri-tourism.

Policy 11.1.8: Encourage agricultural practices that require reduced water demand and utilize the most efficient irrigation practices.

Policy 11.1.9 Support funding opportunities that assist in the replacement of outdated household and commercial appliances with energy efficient appliances.
4.8 Hydrology and Water Quality

General Sustainability Implementation Measures

Implementation 11.1.3: Encourage all new development to implement green building practices which reduce the environmental impact of renovations and new construction by reducing energy and water use, reducing the release of harmful emissions, incorporating sustainable materials in construction, reducing heat island impacts, reducing stormwater quality and quantity impacts, as well as other improvements.

Implementation 11.1.6: The County shall encourage all residents to use of native or adapted vegetation as a part of drought-tolerant landscape materials to reduce water requirements.

Implementation 11.1.8: The County shall implement the following policies for achieving its 2030 sustainability strategy:

- Develop a set of policies and a program of incentives that will encourage developers to build in a more energy- and resource-efficient manner, including the reduction of total water consumption (potable and non-potable) by requiring features such as low-flow fixtures and drought-tolerant landscaping.

- Reduce the use of non-renewable energy by incorporating elements such as photovoltaic panels.

- Reduce energy consumption by designing buildings that take advantage of features such as better insulation (e.g., green roofs), natural ventilation, natural day lighting, efficient lighting fixtures, and solar rather than gas water heaters.

- Incorporate Leadership in Energy and Environmental Design (LEED) for Neighborhood Development program requirements into development plans of greater than ten homes if feasible.

- Reduce stormwater runoff by implementing features that promote groundwater infiltration (e.g., bioswales) and reuse of stormwater (e.g., rainwater harvesting) for non-potable uses such as irrigation and toilet flushing.

Implementation 11.1.9: The County shall implement the following State sustainability legislation:
Assembly Bill (AB) 32 (Global Warming Solutions Act of 2006): AB 32 requires California to reduce its total greenhouse gas emissions to 1990 levels by 2020. AB 32 was preceded by Executive Order S-3-05 of 2005, which required an 80 percent reduction in greenhouse gas emissions from 1990 levels by 2050.

Senate Bill (SB) 375 (2008): SB 375 requires each federally-designated Metropolitan Planning Organization (MPO) in California to develop a “sustainable communities strategy” to reduce greenhouse gas emissions from automobiles and light trucks. SB 375 is related to and helps achieve the goals of the previously-approved Assembly Bill (AB) 32.

Assembly Bill (AB) 1358 (California Complete Streets Act of 2008): AB 1358 requires that, upon any substantive revision of the General Plan Circulation Element, the community’s circulation plan be modified to plan for a balanced, multimodal circulation system. The circulation plan must be designed to meet the needs of all users of area roadways, defined to include motorists, bicyclists, pedestrians, children, persons with disabilities, seniors, movers of commercial goods, and users of public transportation.

Assembly Bill (AB) 170 (2003): Requires the County to amend appropriate elements of its General Plan to include data, analysis, comprehensive goals, policies, and feasible implementation strategies to improve air quality no later than one year after the first revision of its Housing Element that occurs after January 1, 2004.

Assembly Bill (AB) 1881: Requires the County to adopt a water efficiency landscape ordinance to meet or exceed standards established by the California Department of Water Resources.

Potential Impacts Related to Consistency with Kern County General Plan

Table 4.8-5 provides an analysis of the proposed project with the relevant goals and policies of the General Plan. As indicated in Table 4.8-5, the proposed project would be consistent with the relevant goals and policies related to hydrology and water quality. Therefore, the impacts of the proposed project would be considered less than significant.
### Table 4.8-5

**Consistency of Proposed Specific Plan with Kern County General Plan**

<table>
<thead>
<tr>
<th>Relevant Goal or Policy</th>
<th>Consistency Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Land Use, Open Space, and Conservation Element</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Goal: Physical and Environmental Constraints</strong></td>
<td>The Specific Plan Land Use Plan provides future growth located around the existing communities in order to retain the small town character and the general respective boundaries of each community, conserve resources, avoid hazards, and provide adequate public services and utilities. The Land Use Plan addresses the siting and types of land use that could be incompatible with or physically or environmentally constrained by natural hazards. To the extent feasible, the hazardous areas that are unsuitable for human occupancy have been designated as open space with limited recreation, agricultural lands, or wildlife habitat. The Specific Plan Area Public Safety Element provides goals, policies, and implementation measures that address natural hazards in order to minimize injuries, the loss of life, and property damage resulting in economic and social diseconomies.</td>
</tr>
<tr>
<td>1. To strive to prevent loss of life, reduce personal injuries, and property damage, minimize economic and social diseconomies resulting from natural disaster by directing development to areas which are not hazardous.</td>
<td></td>
</tr>
<tr>
<td><strong>Policies: Physical and Environmental Constraints</strong></td>
<td>Refer to the analysis of Goal 1 above. Section 4.6, Geology and Soils, provides a detailed discussion of the geologic and seismic-related hazards within the Specific Plan Area. Section 4.8, Hydrology and Water Quality, of this EIR provides a discussion of flood hazards. As a result of this analysis, the Specific Plan Land Use Plan includes hazard overlays that address seismic hazards, shallow groundwater, and flood hazards. In addition, Section 4.7, Hazards and Hazardous Materials, of this EIR provides a discussion of the potential hazards associated with the closed Kern Valley Landfill, closed burn dumps, and the currently operating Kern Valley Transfer Station within the Specific Plan Area. The Specific Plan Land Use Plan designates land adjacent to the Kern Valley Landfill property as 3.4.1 (Solid Waste Facility Buffer).</td>
</tr>
<tr>
<td>1. Kern County will ensure that new developments will not be sited on land that is physically or environmental constrained (Map Code 2.1 (Seismic Hazard), Map Code 2.2 (Landslide), Map Code 2.3 (Shallow Groundwater), Map Code 2.5 (Flood Hazard), Map Codes from 2.6 – 2.9, Map Code 2.10 (Nearby Waste Facility), and Map Code 2.11 (Burn Dump Hazard)) to support such development unless appropriate studies establish that such development will not result in unmitigated significant impact.</td>
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### TABLE 4.8-5 (C O N T’ D)  
**CONSISTENCY OF PROPOSED SPECIFIC PLAN WITH KERN COUNTY GENERAL PLAN**

<table>
<thead>
<tr>
<th>Relevant Goal or Policy</th>
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<tr>
<td>2.</td>
<td>Refer to the analysis of Goal 1 and Policy 1 above.</td>
</tr>
<tr>
<td>In order to minimize risk to Kern County residents and their property, new development will not be permitted in hazard areas in the absence of implementing ordinances and programs. These ordinances will establish conditions, criteria, and standards for the approval of development in hazard areas.</td>
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<tr>
<td>3. Zoning and other land use controls will be used to regulate and, in some instances, to prohibit development in hazardous areas.</td>
<td>Refer to the analysis of Goal 1 and Policy 1 above.</td>
</tr>
<tr>
<td>8. Encourage the preservation of the floodplain’s flow conveyance capacity, especially in floodways, to be open space/passive recreation areas throughout the County.</td>
<td>Refer to the analysis of Goal 1. The Specific Plan Safety Element provides Policy 6.2.4 that states “Maintain primary floodway’s flow conveyance capacities by preserving open space and recreation areas with the floodways.”</td>
</tr>
<tr>
<td>9. Construction of structures that impede water flow in a primary floodplain will be discouraged.</td>
<td>Refer to the analysis of Goal 1. The Specific Plan Safety Element provides Policy 6.2.7 that states “Construction of structures in the primary floodway that obstruct the natural flow of water is prohibited.”</td>
</tr>
<tr>
<td>10. The County will allow lands which are within flood hazard areas, other than primary floodplains, to be developed in accordance with the General Plan and Floodplain Management Ordinance, if mitigation measures are incorporated so as to ensure that the proposed development will not be hazardous within the requirements of the Safety Element (Chapter 4) of this General Plan.”</td>
<td>Refer to the analysis of Goal 1. The Specific Plan Safety Element provides Policy 6.2.8 that states “On existing lots of record, all structures along with all attendant utilities shall be located outside the primary floodplain. If no site is available outside the primary floodplain, construction shall be consistent with Federal Emergency Management Agency and Kern County Engineering, Surveying and Permit Services Department requirements and will require a Conditional Use Permit in the Floodplain Primary (FPP) District.” In addition, Implementation Measure 6.2.1 requires “flood studies as part of discretionary permit application and site plan review within areas designated Map Code 2.5 (Flood Hazard) on the Physical and Environmental Constraints Map (Figure 6-1), and as required by the Kern County Engineering, Surveying and Permit Services Department.” In addition, all development within the Specific Plan would occur consistent with the General Plan and Floodplain Management Ordinance.</td>
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### 4.8 Hydrology and Water Quality

#### TABLE 4.8-5 (CONT’D)

### CONSISTENCY OF PROPOSED SPECIFIC PLAN WITH KERN COUNTY GENERAL PLAN

<table>
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<tr>
<th>Relevant Goal or Policy</th>
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<tbody>
<tr>
<td>11. Protect and maintain watershed integrity within Kern County.</td>
<td>The Specific Plan Open Space and Recreation Element provides goals, policies, and implementation measures to protect and maintain water and the related natural systems within the watershed. This includes Policy 4.1.3 that states “Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood protection ordinances.” Policy 4.1.3 requires “Discretionary projects shall address watershed impacts and reduce impacts from construction-related activities, as well as alterations of flow patterns and introduction of impervious surfaces to prevent the degradation of the watershed as required by the National Pollution Discharge Elimination System (NPDES) permit.” In addition, Policy 4.1.5 that states “Areas along rivers and streams will be conserved to enhance drainage, flood control, recreational, and other beneficial uses while acknowledging existing land use patterns.”</td>
</tr>
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</table>

#### Goals: Public Facilities and Services

| 5. Ensure that adequate supplies of quality (appropriate for intended use) water are available to residential, industrial, and agricultural uses within Kern County. | In addition to the requirements of CEQA and Kern County, the Specific Plan Land Use Element Goal 2.1.10 indicates that applications that amend the Specific Plan and discretionary applications that implement the plan may be subject to additional CEQA consideration and the submittal of additional technical documentation to the County. In addition, the Specific Plan Land Use Element, Conservation Element, and Public Facilities and Services provide goals, policies, and implementation measures that address the water quality and the management of the water supply from groundwater resources including the development of Urban Water Management Plans, development of an areawide Groundwater Management Plan, and the implementation water conservation measures including the use of reclaimed water, drought tolerant plants, recycling of cooling system water, and other water saving devices consistent with the County Code of Building Regulations. |
### TABLE 4.8-5 (CONT’D)
**CONSISTENCY OF PROPOSED SPECIFIC PLAN WITH KERN COUNTY GENERAL PLAN**

<table>
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<th>Relevant Goal or Policy</th>
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<tr>
<td>9. Serve the needs of industries and Kern County residents in a manner that does not degrade the water supply and the environment and protect the public health and safety by avoiding surface and subsurface nuisances resulting from the disposal of hazardous wastes, irrespective of the geographic origin of the waste.</td>
<td>Refer to Section 4.7, Hazards and Hazardous Materials, of this EIR for a discussion of the disposal of hazardous waste within the Specific Plan Area. The future development of the Specific Plan would be required to dispose of hazardous wastes consistent with federal and State law, local regulatory requirements, and the goals, policies, and implementation measures related to water quality. Specific Plan Public Facilities and Services Element Implementation Measure 9.3.1 requires that “Prior to approval of any Specific Plan Amendment or subdivision approval, applicants shall provide information for review and approval by the Kern County Environmental Health Services Department regarding the sources, quality, and quantity of water to be supplied.”</td>
</tr>
<tr>
<td>11. Reduce residential contamination of groundwater by encouraging sanitary sewer systems.</td>
<td>The Specific Plan Public Facilities and Services Element provides Policy 9.1.1 which states “Community sewage treatment and disposal facilities with collection systems will be required for all new developments of 25 or more lots proposed as one development or cumulatively with other new developments in a community area, unless soils engineering studies performed at the time of any land division project, and approved by the Kern County Environmental Health Services Department, indicate that alternative septic systems, either individual or community design, are equal to or better than a community collection, treatment, and disposal system.” Specific Plan Public Facilities and Services Element provides Policy 9.1.1 which indicates that “Within areas of existing urban density that are experiencing repeated septic system failures, residents should explore methods (assessment districts) for financing the installation of public sewage systems.” Consistent with federal and State law, the provision of any sewage collection system, treatment facilities, and disposal would need to occur consistent with the requirements of the California Regional Water Quality Control Board. In addition, the provision of any sewage disposal and water supply systems provided for existing or proposed development within the Specific Plan Area would occur consistent with the requirements of the Kern County Environmental Health Services Department and the California Regional Water Quality Control Board.</td>
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</table>
### Table 4.8-5 (Cont’d)
**CONSISTENCY OF PROPOSED SPECIFIC PLAN WITH KERN COUNTY GENERAL PLAN**

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<thead>
<tr>
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<tbody>
<tr>
<td><strong>Policies: Public Facilities and Services</strong></td>
<td>In addition to the requirements of CEQA and Kern County, the Specific Plan Land Use Element Implementation Measure 2.1.10 indicates that applications that amend the Specific Plan and discretionary applications that implement the plan may be subject to additional CEQA consideration and the submittal of additional technical documentation to the County. As a result, the adequacy of the provision of public services, utilities, and facilities would be addressed in these analyses. This would include the identification of the pro-rata share of the cost of the public services, utilities, and facilities required to support the proposed development.</td>
</tr>
<tr>
<td>1. New discretionary development will be required to pay its proportional share of the local costs of infrastructure improvements required to service such development.</td>
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<tr>
<td>2. The efficient and cost-effective delivery of public services and facilities will be promoted by designating areas for urban development which occur within or adjacent to areas with adequate public service and facility capacity.</td>
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<tr>
<td>a. Ensure that water quality standards are met for existing users and future development.</td>
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<tr>
<td>b. Ensure that adequate storage, treatment, and transmission facilities are constructed concurrently with planned growth.</td>
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<tr>
<td>c. Ensure the maintenance and repair of existing water systems.</td>
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<tr>
<td>d. Encourage the utilization of wastewater treatment facilities which provide for the reuse of wastewater.</td>
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<tr>
<td>e. Encourage the consolidation or elimination of small water systems.</td>
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<tr>
<td>f. Encourage the conversion of private sewer systems (septic tanks) to public systems.</td>
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<tr>
<td><strong>Goal: Resource</strong></td>
<td>The Specific Plan Land Use Plan provides future growth located around the existing communities in order to retain the small town character and the general respective boundaries of each community, conserve resources, avoid hazards, and provide adequate public services and utilities. The Specific Plan provides goals, policies, and implementation measures in support of this.</td>
</tr>
<tr>
<td>1. To contain new development within an area large enough to meet generous projections of foreseeable need, but in locations which will not impair the economic strength derived from the petroleum, agriculture, rangeland, or mineral resources, or diminish the other amenities which exist in the County.</td>
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</table>
### TABLE 4.8-5 (CONT’D)
**CONSISTENCY OF PROPOSED SPECIFIC PLAN WITH KERN COUNTY GENERAL PLAN**

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<tr>
<th>Policies: Resource</th>
<th>Consistency Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>10.</strong> To encourage effective groundwater resource management for the long-term economic benefit of the County the following shall be considered:</td>
<td>Refer to the analysis of Goal 1 above. Refer to Subsection 4.8.2 above for a discussion of the groundwater conditions in the Specific Plan Area. The Specific Plan Land Use Element, Conservation Element, and Public Facilities and Services provide goals, policies, and implementation measures that address the management of groundwater resources including the development of Urban Water Management Plans, development of an areawide Groundwater Management Plan, and the implementation water conservation measures including the use of reclaimed water, drought tolerant plants, recycling of cooling system water, and other water saving devices consistent with the County Code of Building Regulations.</td>
</tr>
<tr>
<td>a. Promote groundwater recharge activities in various zone districts.</td>
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<tr>
<td>b. Support for the development of Urban Water Management Plans and promote Department of Water Resources grant funding for all water providers.</td>
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<tr>
<td>c. Support the development of groundwater management plans.</td>
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<tr>
<td>d. Support the development of future sources of additional surface water and groundwater, including conjunctive use, recycled water, conservation, additional storage of surface water and groundwater, and desalination.</td>
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</tr>
<tr>
<td><strong>11.</strong> Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood protection ordinances.</td>
<td>The Specific Plan Open Space and Recreation Element provides goals, policies, and implementation measures to protect and maintain water and the related natural systems within the watershed. This includes Policy 4.1.4 that states “Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood protection ordinances.”</td>
</tr>
<tr>
<td><strong>20.</strong> Areas along rivers and streams will be conserved where feasible to enhance drainage, flood control, recreational, and other beneficial uses while acknowledging existing land use patterns.</td>
<td>Refer to the analysis of Policy 11 above. In addition, Specific Plan Open Space and Recreation Element provides Policy 4.1.5 that states “Areas along rivers and streams will be conserved to enhance drainage, flood control, recreational, and other beneficial uses while acknowledging existing land use patterns.”</td>
</tr>
<tr>
<td><strong>Goals: General Provisions</strong></td>
<td></td>
</tr>
<tr>
<td><strong>1.</strong> Ensure that the County can accommodate anticipated future growth and development while maintaining a safe and healthful environment and a prosperous economy by preserving valuable natural resources, guiding development away from hazardous areas, and assuring the provision of adequate public services.</td>
<td>The Specific Plan Land Use Plan provides future growth located around the existing communities in order to retain the small town character and the general respective boundaries of each community, conserve resources, avoid hazards, and provide adequate public services and utilities. The Specific Plan provides goals, policies, and implementation measures in support of this.</td>
</tr>
</tbody>
</table>
### TABLE 4.8-5 (CONT’D)
**CONSISTENCY OF PROPOSED SPECIFIC PLAN WITH KERN COUNTY GENERAL PLAN**

<table>
<thead>
<tr>
<th>Relevant Goal or Policy</th>
<th>Consistency Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Policies: General Provisions - Public Services and Facilities</strong></td>
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</tr>
<tr>
<td>12. All methods of sewage disposal and water supply shall meet the requirements of the Kern County Environmental Health Services Department and the California Regional Water Quality Control Board. The Environmental Health Department shall periodically review and modify, as necessary, its requirements for sewage disposal and water supply, and shall comply with any new standards adopted by the State for implementation of Government Code Division 7 of the Water Code. Chapter 4.5 (Section 13290-13291-7). (Assembly Bill 855)(2000).</td>
<td>The Specific Plan Public Facilities and Services Element provides Policy 9.1.1 which states “Community sewage treatment and disposal facilities with collection systems will be required for all new developments of 25 or more lots proposed as one development or cumulatively with other new developments in a community area, unless soils engineering studies performed at the time of any land division project, and approved by the Kern County Environmental Health Services Department, indicate that alternative septic systems, either individual or community design, are equal to or better than a community collection, treatment, and disposal system.” Specific Plan Public Facilities and Services Element provides Policy 9.1.1 which indicates that “Within areas of existing urban density that are experiencing repeated septic system failures, residents should explore methods (assessment districts) for financing the installation of public sewage systems.” Consistent with federal and State law, the provision of any sewage collection system, treatment facilities, and disposal would need to occur consistent with the requirements of the California Regional Water Quality Control Board. In addition, the provision of any sewage disposal and water supply systems provided for existing or proposed development within the Specific Plan Area would occur consistent with the requirements of the Kern County Environmental Health Services Department and the California Regional Water Quality Control Board.</td>
</tr>
</tbody>
</table>
| 17. The extent of community-type public services and facilities required for urban densities in the Mountain, Valley, and Desert regions vary according to the following criteria:  
  a. Within the Valley and Desert regions, new residential development sites less than or equal to one acre net lot size density, commercial, and industrial land uses shall be serviced by necessary and appropriate sewer and water systems.  
  b. Within the Mountain Region, new residential development sites less than or equal to 2½ acres gross lot size density, commercial, and industrial land uses shall be serviced by necessary and appropriate sewer and water systems. | Refer to the analysis of Policy 12 above. In addition, the Specific Plan Land Use Element, Conservation Element, and Public Facilities and Services Element provide goals, policies, and implementation measures that address the provision of water service and distribution systems within the Specific Plan Area. |
### Relevant Goal or Policy

<table>
<thead>
<tr>
<th>Policies: General Provisions - Surface Water and Groundwater</th>
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<tbody>
<tr>
<td><strong>34.</strong> Ensure that water quality standards are met for existing users and future development.</td>
</tr>
<tr>
<td>Consistency Analysis</td>
</tr>
<tr>
<td>Refer to Subsection 4.8.2 above for a discussion of the groundwater conditions in the Specific Plan Area.</td>
</tr>
<tr>
<td><strong>35.</strong> Ensure that adequate water storage treatment, and transmission facilities are constructed concurrently with planned growth.</td>
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<td>Consistency Analysis</td>
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<tr>
<td>Refer to Subsection 4.8.2 for a discussion of the groundwater conditions that provide the water supply within the Specific Plan Area. The Specific Plan Land Use Element, Conservation Element, and Public Facilities and Services provide goals, policies, and implementation measures that address the management of groundwater resources including the development of Urban Water Management Plans, development of an areawide Groundwater Management Plan, and the implementation water conservation measures including the use of reclaimed water, drought tolerant plants, recycling of cooling system water, and other water saving devices consistent with the County Code of Building Regulations. Goal 9.2.1 in the Public Facilities and Services states the intent of the Specific Plan to “Support affordable coordinated, comprehensive, and reliable water supply systems and facilities capable of meeting both normal and dry year water demands.”</td>
</tr>
<tr>
<td><strong>39.</strong> Encourage the development of the County’s groundwater supply to sustain and ensure water quality and quantity for existing users, planned growth, and maintenance of the natural environment.</td>
</tr>
<tr>
<td>Consistency Analysis</td>
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<tr>
<td>Refer to the analysis of Policy 35 above.</td>
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<tr>
<td><strong>40.</strong> Encourage utilization of community water systems rather than the reliance on individual wells.</td>
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<td>Consistency Analysis</td>
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<tr>
<td>Refer to the analysis of Policy 35 above. The Specific Plan Public Facilities and Services Element provides goals, policies, and implementation that address the provision of water service to the existing and proposed development within the Specific Plan Area.</td>
</tr>
<tr>
<td><strong>41.</strong> Review development proposals to ensure adequate water is available to accommodate projected growth.</td>
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<tr>
<td>Consistency Analysis</td>
</tr>
<tr>
<td>Refer to the analysis of Goal 12 and Policy 35 above. The Specific Plan Public Facilities and Services Element provides Implementation Measure 9.2.1 which requires that “Specific Plan Amendments subject to environmental review and not otherwise subject to California Water Code Section 10910 shall demonstrate through a water supply assessment that a long-term water supply for 20-year timeframe is available.”</td>
</tr>
<tr>
<td><strong>42.</strong> Encourage water supply purveyors to prepare master water plans for those areas of the County approaching existing design thresholds, including documentation of areas in need of system maintenance and repair.</td>
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<tr>
<td>Consistency Analysis</td>
</tr>
<tr>
<td>Refer to the analysis of Policy 35 above. Consistent with County requirements, the water supply purveyors within the Specific Plan Area would prepare master water plans.</td>
</tr>
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### 4.8 Hydrology and Water Quality

#### TABLE 4.8-5 (CONT’D)  
CONSISTENCY OF PROPOSED SPECIFIC PLAN WITH KERN COUNTY GENERAL PLAN

<table>
<thead>
<tr>
<th>Relevant Goal or Policy</th>
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<tr>
<td>43. Drainage shall conform to the Kern County Development Standards and the Grading Ordinance.</td>
<td>The stormwater drainage for the future development as a result of the Specific Plan would comply with the local regulatory requirements including the Kern County Development Standards and the Grading Ordinance.</td>
</tr>
<tr>
<td>44. Discretionary projects shall analyze watershed impacts and mitigate for construction-related and urban pollutants, as well as alterations of flow patterns and introduction of impervious surfaces as required by the California Environmental Quality Act (CEQA), to prevent the degradation of the watershed to the extent practical.</td>
<td>In addition to the requirements of CEQA and Kern County, the Specific Plan Land Use Element Goal 2.1.10 indicates that applications that amend the Specific Plan and discretionary applications that implement the plan may be subject to additional CEQA consideration and the submittal of additional technical documentation to the County. This would include the potential environmental effects to the watershed from construction activities and the identification of mitigation to reduced defined impacts. In addition, Policy 4.1.3 requires “Discretionary projects shall address watershed impacts and reduce impacts from construction-related activities, as well as alterations of flow patterns and introduction of impervious surfaces to prevent the degradation of the watershed as required by the National Pollution Discharge Elimination System (NPDES) permit.” In addition, Policy 4.1.5 that states “Areas along rivers and streams will be conserved to enhance drainage, flood control, recreational, and other beneficial uses while acknowledging existing land use patterns.”</td>
</tr>
<tr>
<td>45. New high consumptive water uses, such as lakes and golf courses, should require evidence of additional verified sources of water other than local groundwater. Other sources may include recycled stormwater or wastewater.</td>
<td>Refer to the analysis of Policy 39 above. The Specific Plan Conservation Element provides Policy 5.3.1 that states “New high consumptive water uses, such as lakes and golf courses, should require evidence of additional verified sources of water other than local groundwater. Other sources may include recycled stormwater or wastewater.”</td>
</tr>
</tbody>
</table>
### Table 4.8-5 (Cont’d)

**Consistency of Proposed Specific Plan with Kern County General Plan**

<table>
<thead>
<tr>
<th>Relevant Goal or Policy</th>
<th>Consistency Analysis</th>
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<tr>
<td><strong>Safety Element</strong></td>
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<tr>
<td><strong>Goals</strong></td>
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<tr>
<td>1. Minimize injuries and loss of life and reduce property damage.</td>
<td>The Specific Plan Public Safety Element provides constraints overlays to the Land Use Plan to identify seismic hazards, shallow groundwater, steep slopes (slopes greater than 30 percent), and flood hazards within the Specific Plan Area. In addition, the Public Safety Element provides a goal, policies, and implementation measures that address flood hazards, including dam inundation, in order to prevent the potential for the loss of life and injury and minimize the damage to structures and other property.</td>
</tr>
<tr>
<td>2. Reduce economic and social disruption resulting from earthquakes, fire, flooding, and other geologic hazards by assuring the continuity of vital emergency public services and functions.</td>
<td>Refer to the analysis of Goal 1 above. For future development in the Specific Plan Area, a geotechnical evaluation would be required and a flood study for projects within the flood hazard area may be required prior to the County’s approval of any discretionary application. The geotechnical evaluation would define special requirements that would need to be provided in the design of the development in addition to the State law and local ordinances including the CBC (Seismic Zone 4 standards) and the Alquist-Priolo Earthquake Faulting Zone Act. The flood study would consider raising the lowest floor elevations, minimizing or prohibiting man-made levees or other channelization improvements that alter the natural flow within the floodplain, and the reduction of impervious surfaces. Compliance with these regulatory requirements and the Specific Plan implementation measures would reduce the potential for economic and social disruption due to earthquakes, other geologic hazards, and flood hazards.</td>
</tr>
<tr>
<td>3. Assist in the allocation of public resources in Kern County to develop information regarding geologic, fire, and flood safety hazards and to develop a systematic approach toward the project of public health, safety, and welfare from such hazards.</td>
<td>Refer to the analysis of Policy 2 above. The preparation of the Specific Plan and this EIR has assisted in the evaluation of information regarding geologic hazards in the Specific Plan Area.</td>
</tr>
<tr>
<td>Relevant Goal or Policy</td>
<td>Consistency Analysis</td>
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<tr>
<td>4. Create an awareness of the residents in Kern County through the dissemination of information about geologic, fire, and flood safety hazards.</td>
<td>The Specific Plan Safety Element Policy 6.2.1 states the intent to “Facilitate public education regarding inundation hazards associated with Isabella Dam shown in Figure 6-3, and work with the U.S. Army Corps of Engineers and the Kern County Fire Department to develop evacuation and disaster plans.” In addition, Implementation Measure 6.4.5 states “Assemble and distribute information concerning emergency management procedures relating to high magnitude, low frequency geologic events such as earthquakes.” This would include information related to dam inundation during a seismic event.</td>
</tr>
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**General Policies**

<table>
<thead>
<tr>
<th>Policy</th>
<th>Consistency Analysis</th>
</tr>
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<tbody>
<tr>
<td>1. That the County’s program of identification, mapping, and evaluating the geologic, fire, flood safety hazard areas, and significant concentrations of hydrogen sulfide in oilfield areas, presently under way by various County departments, be continued.</td>
<td>Refer to the analysis of Policy 2 above.</td>
</tr>
<tr>
<td>3. That the County government encourage public support of local, State, and federal research programs on geologic, fire, flood hazards, valley fever, plague, and other studies so that acceptable risk may be continually reevaluated and kept current with contemporary values.</td>
<td>The preparation of the Specific Plan and this EIR has assisted in the evaluation of information regarding geologic hazards in the Specific Plan Area. This evaluation is available for use by the appropriate governmental agencies in the consideration of research programs.</td>
</tr>
<tr>
<td>4. The County shall encourage extra precautions be taken for the design of significant lifeline installations, such as highways, utilities, and petrochemical pipelines.</td>
<td>The preparation of the Specific Plan and this EIR has assisted in the evaluation of information regarding geologic hazards in the Specific Plan Area. This evaluation will be utilized in determining the suitability of siting significant public facilities and infrastructure in the Specific Plan Area.</td>
</tr>
</tbody>
</table>

**Policies: Dam Failures, Flooding, and Inundation**

<table>
<thead>
<tr>
<th>Policy</th>
<th>Consistency Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Design discretionary critical facilities located within the potential inundation area for dam failure in order to mitigate the effects of inundation on the facility; promote orderly shutdown and evacuation (as appropriate); and prevent on-site hazards from affecting building occupants and the surrounding communities in the event of dam failure.</td>
<td>For future development in the Specific Plan Area, a geotechnical evaluation, including inundation due to dam failure during a seismic event, would be required prior to the County’s approval of any discretionary application. The geotechnical evaluation would define special requirements that would need to be provided in the siting and design of the development in addition to the State law and local ordinances including the CBC (Seismic Zone 4 standards).</td>
</tr>
</tbody>
</table>
### Table 4.8-5 (Cont’d)
**Consistency of Proposed Specific Plan with Kern County General Plan**

<table>
<thead>
<tr>
<th>Relevant Goal or Policy</th>
<th>Consistency Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>2. Design discretionary critical facilities in the potential dam inundation area used for the storage, or use of hazardous materials to prevent on-site hazards from affecting surrounding communities in the event of inundation.</td>
<td>The Specific Plan Land Use Plan addresses the siting of land uses that could be incompatible or are physically or environmentally constrained. The Specific Plan Safety Element policies and implementation measures require geotechnical investigation for all discretionary permits consistent with the County’s requirements. This would include the suitability of the siting and the design of the critical facilities that store or use hazardous materials in order to prevent hazards from affecting the communities in the Specific Plan Area and the portions of Metropolitan Bakersfield in the inundation area.</td>
</tr>
<tr>
<td>3. Require emergency response plans for the planning area to include specific procedures for the sequential and orderly evacuation of the potential dam inundation area.</td>
<td>The Specific Plan Safety Element provides a goal, policies, and implementation measures that address hazards due to inundation as a result of the failure of Isabella Reservoir during a seismic event. Refer to Section 4.8, Hydrology and Water Quality, for a detailed discussion of the consistency with the General Plan goals and policies.</td>
</tr>
<tr>
<td>4. Encourage critical and high occupancy facilities as well as facilities for the elderly, handicapped, and other special care occupants, located in the potential inundation area below the dam to develop and maintain plans for the orderly evacuation of their occupants.</td>
<td>Refer to the analysis of Policy 3 above.</td>
</tr>
</tbody>
</table>
Potential Impacts Related to the Depletion of Groundwater Supplies or Groundwater Recharge

The future development that would occur with the implementation of the Specific Plan would result in an increase in the demand for domestic water and water for agricultural use. Since the groundwater is the primary sources of water supplies in the Specific Plan Area, this would have the potential to result in a significant effect as a result of the substantial depletion of groundwater supplies or the substantial interference with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level. As discussed in detail in Subsection 4.8.2 above, the groundwater rights in the Specific Plan Area are not adjudicated and there is no established groundwater management plan for the basin. Groundwater producers generally pump as much as is needed to meet demands until water levels drop to a point of declining production. Consequently, the Kern River Valley has been subject to various moratoria due to groundwater quality and quantity issues. As indicated in the Subsection 4.8.2, Environmental Setting, above, the calculation of the hydrologic “budget” for the existing groundwater storage in the Specific Plan Area indicates that there is an annual net positive amount in groundwater storage of approximately 14,298 acre-feet/year plus an undetermined net positive amount of underflow (water in the alluvium beneath the surface water drainages).

To address the environmental effects of the proposed project on groundwater supplies, Section 4.16, Utilities and Service Systems, of this EIR provides an analysis of the potential impacts to water supply in the Specific Plan Area. Refer to Section 4.16 for a detailed discussion of this analysis. The analysis concluded, that based on a comparison of the estimated demand (8,276 acre-feet/year) with the hydrologic “budget” (14,298 acre-feet/year), there is an annual net positive amount of approximately 6,022 acre-feet/year in the Kern Valley groundwater basins with the implementation of the Specific Plan in the Year 2003. Therefore, there should be adequate water supply to serve the future development as a result of the Specific Plan in the Year 2030. In addition, as this water demand represents 58 percent of the hydrologic “budget” for the Kern River Valley groundwater basins, the proposed project would not substantially deplete groundwater supplies such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level.

In addition, as discussed in detail in Subsection 4.8.2 above, the groundwater recharge in the Kern River Valley occurs through direct precipitation and infiltration along the Valley’s margins, along the North and South Forks of the Kern River, and along tributaries such as Kelso, Tillie, and Erskine Creeks. A study of the sources of the shallow groundwater concluded that an average annual precipitation of 13.6 inches per year infiltrates into the groundwater basin. This equates to a groundwater recharge from precipitation of approximately 8,766 acre-feet/year in the Specific Plan Area. Due to the low intensity of future development that would occur in the Specific Plan Area and that Specific Plan Land Use Plan does not provide for development or other improvements on approximately 42 percent of the Specific Plan Area located within the Sequoia National Forest, the Keyesville Special Management Area, and scattered parcels of BLM-managed land used for cattle grazing, mining, open space, the proposed project would not 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.

The Specific Plan provides goals, policies, and implementation measures that address the groundwater supplies. Refer to the applicable goals, policies, and implementation measures provided above. Conservation Element Goal 5.3.1 states the intent of the Specific Plan to “Maintain a balance between water supply and water consumption.” This would be accomplished through compliance with policies and implementation measures that address water conservation, including the use of reclaimed water, public education, and the required use of water conservation measures in the County Code of Building Regulations, water supply and distribution, and water quality. Specifically, Public Facilities and Services Element Implementation Measure 9.2.1 requires that “Specific Plan Amendments subject to environmental review and not otherwise subject to California Water Code Section 10910 shall demonstrate through a water supply assessment that a long-term water supply for a 20-year timeframe is available.”

The specific effects as a result of future development proposals would be determined on a case-by-case basis as the land uses defined in the Specific Plan Land Use Plan are addressed during the planning and environmental process by the County prior to the approval of any discretionary permits. The identified impacts would be addressed through project design and mitigation measures provided in the planning and environmental documentation for future development projects in the Specific Plan Area. Therefore, upon compliance with State law, local regulatory requirements including the Kern County General Plan, and the Specific Plan goals, policies, and implementation measures, impacts would be considered less than significant.

**Project Impacts Due to Alteration of Drainage Patterns**

The future development that would occur with the implementation of the Specific Plan would result in an alteration of the existing drainage patterns in some portions of the Specific Plan Area. However, the changes in the existing drainage patterns would not be anticipated to result in substantial erosion or siltation as a result of the alteration of the course of a stream or river. In addition, the changes in the existing drainage patterns would not be anticipated to substantially increase the rate or amount of surface runoff in a manner which would result in flooding as a result of the alteration of the course of a stream or river.

The Specific Plan provides goals, policies, and implementation measures that address the potential impacts to the water features and watershed within the Kern River Valley due to the construction of new development and the alteration of the existing natural features. Refer to the applicable goals, policies, and implementation measures provided above. Goal 4.1.1 states the intent of the Specific Plan to “Protect and maintain water and related natural systems for all existing and future reasonable and beneficial uses within the South Fork Kern and Upper Kern watersheds.” This would be accomplished through compliance with Policy 4.1.4 that states “Minimize the alteration of natural drainage areas. Require development plans to include necessary mitigation to stabilize runoff and silt deposition through utilization of grading and flood-protection ordinances and the
NPDES permit.” In addition, Policy 4.1.3 requires “Discretionary projects shall address watershed impacts and reduce impacts from construction-related activities, as well as alterations of flow patterns and introduction of impervious surfaces to prevent the degradation of the watershed as required by the National Pollution Discharge Elimination System (NPDES) permit.” Further Implementation Measure 4.1.2 requires that “All development shall comply with the requirements of the County’s grading, drainage, and flood control protection ordinances.”

The specific effects as a result of future development proposals would be determined on a case-by-case basis as the land uses defined in the Specific Plan Land Use Plan are addressed during the planning and environmental process by the County prior to the approval of any discretionary permits. The identified impacts would be addressed through project design and mitigation measures provided in the planning and environmental documentation for future development projects in the Specific Plan Area. Therefore, upon compliance with federal and State law, local regulatory requirements including the Kern County General Plan and the County’s grading, drainage, and flood control protection ordinances, and the Specific Plan goals, policies, and implementation measures, impacts would be considered less than significant.

**Project Impacts Related to Water Quality**

The future development that would occur with the implementation of the Specific Plan would result in an increase in the potential for the creation of additional runoff that could provide additional sources of polluted runoff during construction activities and the long-term use of the land uses within the Specific Plan Area. In addition, the future long-term activities on the project site could substantially degrade water quality with the use of septic systems in areas with inappropriate soils or shallow groundwater.

As discussed above in Subsection 4.8.3, Regulatory Setting, future development within the Specific Plan Area would be required to comply with the provisions of the CWA including obtaining a NPDES permit, as appropriate, and developing and implementing a SWPPP including BMPs. In addition, future development that would result in the discharge of pollutants from a “point source” would need to obtain NPDES permits from the Central Valley RWQCB.

The Specific Plan provides goals, policies, and implementation measures that address the protection of water quality to ensure that standards are met for existing and future users. Refer to the applicable goals, policies, and implementation measures provided above. Related to the potential impacts to water quality during construction activities, Policy 4.1.3 requires “Discretionary projects shall address watershed impacts and reduce impacts from construction-related activities, as well as alterations of flow patterns and introduction of impervious surfaces to prevent the degradation of the watershed as required by the National Pollution Discharge Elimination System (NPDES) permit.” Further Implementation Measure 4.1.2 requires that “All development shall comply with the requirements of the County’s grading, drainage, and flood control protection ordinances.”
Goal 6.3.1, which addresses water quality as a result of the existing and future development within the Specific Plan, states the intent of the Specific Plan to “Ensure that wastewater disposal systems adequately protect the health and safety of all Kern River Valley residents and businesses, and groundwater is protected.” This would be accomplished through the implementation of Policy 9.1.3 which requires “New development projects (residential, commercial, and industrial) shall be serviced by appropriate wastewater disposal and water systems as approved by the Kern County Environmental Health Services Department.” In addition, Policy 9.1.1 requires that “Community sewage treatment and disposal facilities with collection systems will be required for all new developments of 25 or more lots proposed as one development or cumulatively with other new developments in a community area, unless soils engineering studies performed at the time of any land division project, and approved by the Kern County Environmental Health Services Department, indicate that alternative septic systems, either individual or community design, are equal to or better than a community collection, treatment, and disposal system.” Further, Implementation Measure 9.1.3 requires “All new discretionary development projects shall be subject to the Standards for Sewage, Water Supply and Preservation of Environmental Health Rules and Regulations administered by the Kern County Environmental Health Services Department. Projects having percolation rates of less than five minutes per inch shall provide a preliminary soils study and site specific documentation that characterizes the quality of upper groundwater in the project vicinity, and an evaluation of the extent to which, if any, the proposed use of alternative septic systems will adversely impact groundwater quality. If the evaluation indicates that the uppermost groundwater at the proposed site already exceeds groundwater quality objectives of the Regional Water Quality Control Board, or would if the alternative septic system is installed, the applicant shall be required to supply sewage collection, treatment and disposal facilities.”

The specific effects as a result of future development proposals would be determined on a case-by-case basis as the land uses defined in the Specific Plan Land Use Plan are addressed during the planning and environmental process by the County prior to the approval of any discretionary permits. The identified impacts would be addressed through project design and mitigation measures provided in the planning and environmental documentation for future development projects in the Specific Plan Area. Therefore, upon compliance with federal and State law, local regulatory requirements including the Kern County General Plan and the County’s grading, drainage, and flood control protection ordinances, and the Specific Plan goals, policies, and implementation measures, impacts would be considered less than significant.

**Project Impacts Related to Flood Hazards**

The future development that would occur with the implementation of the Specific Plan would result in housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map. However, these structures would not be anticipated to impede or redirect flood flows.
The Specific Plan provides goals, policies, and implementation measures that address flood hazards within the Specific Plan Area. Refer to the applicable goals, policies, and implementation measures provided above. Goal 6.2.1 states the intent of the Specific Plan to “Prevent loss of life, reduce personal injuries and property damage, and minimize economic loss resulting from flood hazard, and dam inundation conditions.” To address structures with the flood hazard areas, Policy 6.2.8 indicates “On existing lots of record, all structures along with all attendant utilities shall be located outside the primary floodplain. If no site is available outside the primary floodplain, construction shall be consistent with Federal Emergency Management Agency and Kern County Engineering, Surveying and Permit Services Department requirements and will require a Conditional Use Permit in the Floodplain Primary (FPP) District.” In addition, Implementation Measure 6.2.1 requires “Require flood studies as part of discretionary permit application and site plan review within areas designated Map Code 2.5 (Flood Hazard) on the Physical and Environmental Constraints Map (Figure 6-1), and as required by the Kern County Engineering, Surveying and Permit Services Department.” Further, Implementation Measure states “The Kern County Engineering, Surveying and Permit Services Department may require a flood study for discretionary projects located within a flood hazard area. Mitigation measures which may be considered include: a. Raising the lowest floor elevations to be at least one-foot above the primary floodplain level; b. Minimize or prohibit man-made levees or other channelization improvements that alter the natural flow within the primary floodplain; or c. Reduction of impervious surfaces.”

The specific effects as a result of future development proposals would be determined on a case-by-case basis as the land uses defined in the Specific Plan Land Use Plan are addressed during the planning and environmental process by the County prior to the approval of any discretionary permits. The identified impacts would be addressed through project design and mitigation measures provided in the planning and environmental documentation for future development projects in the Specific Plan Area. Therefore, upon compliance with federal and State law, local regulatory requirements including the Kern County General Plan and the County’s grading, drainage, and flood control protection ordinances, and the Specific Plan goals, policies, and implementation measures, impacts would be considered less than significant.

**Project Impacts Due to Inundation**

**Inundation from the Isabella Reservoir**

Strong seismic ground motion can cause dams and levees to fail, resulting in damage to structures and properties located nearby and downstream. The Isabella Dam (main dam and auxiliary dam) can hold 568,000 acre feet of water. This dam, which is earth-filled, is approximately 185 feet high and 1,725 feet long, and is built near a major earthquake fault. If an earthquake were to occur in the vicinity, it could result in a break in the dam. This could cause the entire lake storage to be released and failure of Isabella Dam could potentially result in inundation of portions of the Hot Springs Valley located southwest of the dam and approximately 60 square miles of Metropolitan Bakersfield. Flood levels have the potential to reach 30 feet, depending on the water level in the lake. The Kern County General Plan indicates the chances of the dam failing entirely, with the lake at...
capacity, was judged as one day in 10,000 years. Inundation is considered a remotely possible event, given that the dam has been constructed to meet State standards and requirements and is subject to periodic inspection. However, the possibility of dam failure does exist. Therefore, hazards due to seismically-induced inundation have the potential to occur within and downstream of the Specific Plan Area. In response to this, Kern County and the ACOE have developed extensive emergency response plans that monitor the dam and will coordinate evacuation procedures upon indication of potential dam failure. Refer to Figure 4.6-4 in Section 4.6, Geology and Soils, of this EIR for the location of the dam inundation area.

The Specific Plan provides goals, policies, and implementation measures that address inundation from the Isabella Reservoir. Refer to the applicable goals, policies, and implementation measures provided above. Goal 6.2.1 states the intent of the Specific Plan to “Prevent loss of life, reduce personal injuries and property damage, and minimize economic loss resulting from flood hazard, and dam inundation conditions.” To address this, Policy 6.2.1 indicates that to “Facilitate public education regarding inundation hazards associated with Isabella Dam shown in Figure 6-3, and work with the U.S. Army Corps of Engineers and the Kern County Fire Department to develop evacuation and disaster plans.” In addition, Implementation Measure 6.2.4 requires “The Kern County Fire Department Office of Emergency Services shall work with the Army Corps of Engineers to develop appropriate emergency plans for the safe evacuation of occupants of areas subject to possible inundation from failure of Isabella Dam and natural flooding.”

The implementation of the Specific Plan would result in future development of land uses that would expose people or property to potential adverse effects from seismically-induced inundation from the Isabella Dam. Due to the remote possibility of this occurring and the ongoing actions being implemented by Kern County and the ACOE, the potential impacts due to seismically-induced inundation by the failure of the Isabella Dam would be considered less than significant.

**Inundation from Due to Seiche**

A seiche is an earthquake-induced wave in a confined body of water, such as a lake or reservoir. Hazards due to a seiche in the Isabella Reservoir would have the potential to occur within the Specific Plan Area. Due to the function of the Isabella Reservoir as a flood control and water resource facility, the adjacent areas have land use restrictions and setback requirements, including to the take line. Therefore, the flooding that would occur as a result of a seiche would not be anticipated to damage property. The other bodies of water within the Specific Plan Area consist of small agricultural ponds. Due to their small sizes and the relatively minor amount of water they store, no flooding as a result of a seiche would be anticipated to occur. Therefore, the potential impacts due to inundation from seiches during a seismic event would be considered less than significant.
4.8 Hydrology and Water Quality

Cumulative Impacts

As discussed in detail in Chapter 3.0, Project Description, of this EIR, three cumulative projects have been identified: the Rio Bravo Ranch (in the Metropolitan Bakersfield Area at the western end of the Kern River Canyon); the Weldon Solar Project (in the Weldon area within the Specific Plan Area); and the Victor Moya project (located between the communities of Lake Isabella and Bodfish within the Specific Plan Area). In addition, an area-wide growth rate of 1.5 percent defined by KernCOG (which includes anticipated growth as a result of the Specific Plan) has been assumed. Since the Victor Moya project consists of the expansion of an existing facility and would be a part of KernCOG’s growth-rate assumptions within the Specific Plan Area and the environmental impacts of the Weldon Solar Project will be fully analyzed in its own EIR, the following analysis addresses the cumulative effects of the Rio Bravo Ranch in conjunction with the proposed project. In addition, due to the isolated location of the Specific Plan Area from other areas in the County, there are no other projects that have specific cumulative environmental effects.

The development of the Rio Bravo Ranch would not contribute to the proposed project’s cumulative effects related to hydrology and water quality due to the distance between the Specific Plan Area and the Rio Bravo Ranch site. The Rio Bravo Ranch has been individually subject to the review of the potential effects related to hydrology and water quality by the City of Bakersfield and required to comply with the State and local regulatory requirements (including CEQA and the Metropolitan Bakersfield General Plan) and site-specific drainage studies that provide recommendations and mitigation measures in order to adequately address the potential effects to hydrology and water quality.

As discussed in detail above, upon compliance with State regulatory requirements, local regulatory requirements, and Specific Plan goals, policies, and mitigation measures, the impacts of the proposed project related to hydrology and water quality would be considered less than significant. Therefore, upon compliance with the regulatory requirements and the Specific Plan goals, policies, and implementation measures, the cumulative impacts of the proposed project in conjunction with the cumulative project related to hydrology and water quality would be considered less than significant.

4.8.5 MITIGATION MEASURES

No mitigation measures are required beyond compliance with goals, policies, and implementation measures identified in the Kern County General Plan and the Kern River Valley Specific Plan.

4.8.6 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Project Impacts

- Impacts related to the depletion of the groundwater supplies would be considered less than significant.
4.8 Hydrology and Water Quality

- Impacts due the alteration of the existing drainage patterns and the potential to result in substantial erosion, siltation, or flooding would be considered less than significant.

- Impacts related to water quality from construction activities and the ongoing use of the future development would be considered less than significant.

- Impacts as a result of the placement of housing within a 100-year flood hazard area would be considered less than significant.

- Impacts due to the potential for inundation from the Isabella Reservoir due to dam failure of seiche hazards would be considered less than significant.

**Cumulative Impact**

- Cumulative impacts related to hydrology and water quality would be considered less than significant.