Issue	Less Than Significant or No Impact	Potential Significant Impact Adequately Addressed in MEIR	MEIR Required Additional Review: No Significant Impact	Less Than Significant Impact Due to Mitigation Measures in Project Description	New Additional Significant Impact Not Addressed in MEIR	New Additional Mitigation Measures Required
5.8 Hydrology and Water Quality. Would the project:						
a) Violate any water quality standards or waste discharge requirements?	❒	■	❒	❒	❒	❒
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	■	❒	❒	❒	❒	❒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	❒	❒	❒	■	❒	❒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?	❒	❒	❒	■	❒	❒
e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?	❒	❒	❒	■	❒	❒
f) Otherwise substantially degrade water quality?	■	❒	❒	❒	❒	❒
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	❒	❒	❒	■	❒	❒
h) Place within a 100-year flood hazard area structures which would impede or redirect flood flows?	❒	❒	❒	■	❒	❒
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding of as a result of the failure of a levee or dam?	❒	❒	❒	■	❒	❒
j) Inundation by seiche, tsunami, or mudflow?	■	❒	❒	❒	❒	❒

Setting

Climate and Topography

Mountain House is located on the western edge of the San Joaquin River Valley. Average annual rainfall in the vicinity of the project site is approximately 12 inches. Average temperatures generally range from 38 degrees Fahrenheit in winter months to 93 degrees Fahrenheit in summer months.

The ground surface of Neighborhoods I and J is generally level and slopes gently (less than one percent) northeast towards Old River. Ground elevations in Neighborhoods I and J range from 0 to 40 feet above mean sea level (MSL).

Geology and Soils

Mountain House is located in the San Joaquin River Valley of the Great Valley geomorphic province, just northeast of the Altamont Hills. The Great Valley is a large depression that has been partially filled by alluvial and marine deposits consisting of gravels, sands, silts, and clays.

The permeability and texture of on-site soils influence drainage patterns at the project site. Soil permeability is the rate at which water is absorbed under saturated conditions and is related to the hydraulic conductivity of the soil. According to the Soil Survey of San Joaquin County, site soils are predominantly clay loams belonging to the Stomar and Capay series (USDA, 1999). These two soil types are characterized as well-drained and moderately well-drained soils formed in alluvium. These soils are classified as having high shrink-swell potential, slow permeability, and a slight hazard of water erosion.

Surface Water Hydrology

Regionally, Mountain House is located within the San Francisco Bay/Sacramento-San Joaquin River Delta System. The Sacramento-San Joaquin Delta estuary is the largest estuary on the west coast and drains over 40 percent of the water in California. The Delta system, consisting of over 1,100 square miles, lies at the confluence of the southward-flowing Sacramento and northward-flowing San Joaquin rivers. The Delta is a flat, low-lying network of 57 islands, interconnected by 700 miles of waterways. The Delta and its watershed are an important source of drinking water and irrigation water in California.

Locally, the project site is located within the Mountain House Creek and Dry Creek watersheds. Mountain House Creek drains an area of approximately 6.5 square miles. The creek has its headwaters approximately 6.5 miles southwest of the project site in the Altamont Hills. Dry Creek is located parallel to and approximately 8,000 feet northwest of Mountain House Creek. Dry Creek has a drainage area of approximately 6.8 square miles and runs in a general northerly direction across Neighborhood I to Old River. Significant modifications to the natural creek have resulted from agricultural practices in the area, particularly downstream of the Delta-Mendota Canal.

Currently, runoff from the overall Mountain House community generally flows in a northeasterly direction across the Mountain House site to Old River. Prior to any development on the 4,800-acre property of the Mountain House community, drainage infrastructure was limited to agricultural drainage ditches and some drainage pipes at street crossings. Agricultural ditches are gradually being replaced with new drainage infrastructure as Mountain House builds out. Runoff from some portions of the northwestern portion of Neighborhood I currently drains west towards existing residences and other properties along Kelso Road and in Alameda County. Proposed drainage improvements for this area are discussed later in this section.

100-Year Floodplain

Current Federal Emergency Management Agency (FEMA) maps for San Joaquin County designate approximately 1 square mile of Neighborhoods I, K, and L (elevations below 8 feet above MSL) as being within the 100-year flood hazard zone for Old River. The flood zone forms a band about 1,500 to 2,000 feet wide along the base of the Old River levee at the north edge of the community. This is because the existing levee along Old River was constructed with un-engineered fill and was not designed to withstand forces of strong ground shaking. Potential failure of the levee could cause significant flooding in a portion of the site.

Groundwater

The Department of Water Resources (DWR) defines state groundwater basins based on geologic and hydrogeologic conditions. According to the DWR, the project site is located within the Tracy groundwater subbasin. The subbasin has an area of approximately 540 square miles and is drained by the San Joaquin River and Corral Hollow Creek. Primary water-bearing formations in the subbasin include semi-consolidated deposits of clay, silt, and gravel of the Tulare Formation, flood basin deposits, and older and younger alluvium (DWR, 2002).

Generally, groundwater flows as a subdued reflection of the surface topography. Hydrographs for the Tracy subbasin indicate that the majority of water levels in wells within the subbasin have remained relatively stable over time. During subsurface investigations performed in Neighborhoods I and J in March 2004, groundwater was encountered at depths of 5 to 9 feet below ground surface (bgs), and 6 to 11 feet bgs, respectively (Condor, 2004b, 2004c).

The water quality of the Tracy subbasin is somewhat impaired. Areas of poor water quality exist throughout the subbasin and elevated levels of chloride and nitrate have been encountered in the vicinity of the City of Tracy. According to the 1994 MEIR, elevated levels of total dissolved solids (TDS), nitrates, and sulfides have been encountered in groundwater resources in the vicinity of the project site. The high levels of TDS may be the result of saltwater intrusion from the Delta. Relatively high levels of nitrates may be the result of poor livestock management in the surrounding area and/or releases from household septic systems.

Project Studies

The applicant has completed the following studies related to storm drainage for the Specific Plan II area, of which Neighborhoods I and J are a part:

- Pacific Advanced Civil Engineering (PACE), Inc., April 2002. *Master Drainage Plan.*
- Pacific Advanced Civil Engineering (PACE), Inc., May 2004. *Storm Water Master Plan Update, Addendum I.*
- Pacific Advanced Civil Engineering (PACE), Inc., April 2004. *Kelso Road Conceptual Drainage and Grading Study.*
- Condor Earth Technologies, May 2004. Farm Irrigation Report, Neighborhoods I and J, Mountain House, California.
- Pacific Advanced Civil Engineering (PACE), Inc., September 28, 2006. *Storm Water Master Plan Update, Addendum II.*

All of these studies can be reviewed at the San Joaquin County Community Development Department.

Storm Water Master Plan Update

The Mountain House Storm Water Master Plan (updated September 28, 2006) presents the results of HEC-1 and HEC-RAS modeling conducted for Mountain House and forms the basis for the updated conceptual drainage improvements associated with the development of Neighborhoods I and J. Drainage-related improvements proposed for the area include primary and secondary storm drain systems, improvements to Mountain House Creek, golf course/Best Management Practices (BMPs) in Neighborhoods I and J, Old River levee improvements, and drainage improvements in the Kelso Road area. Drainage improvements would be built as needed based on the phased construction of Neighborhoods I and J.

It should be noted that the first flush of runoff from all developed areas of Mountain House is considered "urban" runoff and would be treated in storm water quality BMPs prior to discharge to Mountain House Creek, Dry Creek, and/or Old River.

Primary Storm Drain System. The primary storm drainage system would provide conveyance of all off-site runoff and on-site runoff and would include trunk storm drain pipes (72-inch diameter and larger), major open channels, and water quality/detention basins. Pipes and open channels would be designed for the 100-year flood capacity to the point of terminal discharge at Old River.

Secondary Storm Drain System. The secondary storm drainage system would be located within the local and collector streets and would consist of gutters, local drainage swales, minor channels, catch basins, catch basin laterals, and smaller storm drain pipes (smaller than 72-inch diameter). This system would

transport on-site drainage to trunk lines, water quality/detention basins, or terminal drains.

Mountain House Creek Restoration Improvements. Restoration improvements to Mountain House Creek have been designed and are currently being constructed to provide adequate flood protection and water quality benefits to accommodate the proposed development under both Specific Plans I and II. These improvements will avoid the need to construct a new levee system. The improvements were sized to convey the 100-year storm event, and to accommodate runoff resulting from a sudden and complete failure of both earthen dams located upstream of the project site in Alameda County. The improvements to Mountain House Creek have been evaluated in a separate environmental document (SJCCDD, 2003).

Dry Creek and Adjacent Detention Basins. Prior to the adoption of Specific Plan II, the Master Plan originally called for the portion of Dry Creek jurisdictional areas west of existing Kelso Road to be avoided and those to the east to be relocated and restored in a manner similar to Mountain House Creek. After consultation with the regulatory agencies, it was decided that no changes to the current Dry Creek corridor would be completed and wetlands associated with Dry Creek would be avoided. Therefore, no changes would be made directly to Dry Creek, as the channel bed and low-flow characteristics would remain unchanged. The existing culverts would not be removed and, where possible, would be used for future streets and golf-cart crossings within Neighborhood I. Dry Creek discharges into Old River through a series of pump stations and existing outfalls. These pumps stations and outfalls would be maintained. Dry Creek watershed runoff from Neighborhoods I and J would be collected in detention basins and then pumped into Old River.

Two detention basins would be built, one on each side of Dry Creek at its terminus near Old River. The two basins would be wet basins similar to the ponds and lakes within the golf course and would provide water quality treatment. A culvert under Dry Creek would interconnect them. Construction of the culvert would require jacking and boring under Dry Creek to ensure the creek is not disturbed. A pump station would be located at the basin on the east side of Dry Creek to pump excess runoff to an interim pond in Neighborhood K.

Golf Course/BMPs. The ponds and lakes within the golf course would provide water quality treatment and detention storage for storm water runoff. The ponds and lakes would be interconnected by a combination of low-flow pipes, swales and culverts throughout the golf course. These water features are designed to enhance flood detention, encourage sedimentation, and diversify habitats. Additional water quality BMPs to be implemented in the golf course areas include biofilters, wet ponds, constructed wetlands, and micropool extended detention basins. Flood detention areas within the golf courses would be pumped to Dry Creek, Mountain House Creek, and/or directly to the Old River. Erosion protection measures such as soil reinforcement materials, turf reinforcement materials, rip rap, and/or cobble, would be used at all drainage facility outlets.

Low areas adjacent to fairways and tee facilities within the golf courses would also be used as seasonal detention basins to provide additional storm runoff volume storage as needed.

Neighborhood I and J. Storm water runoff from developed areas within Neighborhood I, including runoff from the existing and proposed lots along Old River, would be directed to the golf course and discharged into the detention basins. From there, the water would be pumped into Old River.

Runoff within Neighborhood J would be conveyed through the golf course into a system of ponds and lakes, and then discharged to an interim pond within Neighborhood K. From there, the water would flow into Mountain House Creek and Old River.

Old River Levee Improvements

The existing levees along Old River and Wicklund Road are constructed of un-engineered fill and are not designed to withstand forces of strong ground shaking. Expected moderate to strong ground shaking could cause levee failure and subsequent flooding of a portion of the project site.

Due to the potential failure of the existing levees along Old River and Wicklund Road, current FEMA maps for San Joaquin County designate approximately 1 square mile of Neighborhoods I, K, and L (elevations below 8 feet above MSL) as being within the 100-year flood hazard zone for Old River. This potential flood hazard is proposed to be mitigated by using engineered fill to fill areas behind the existing levee and to elevate proposed building pads above the base flood elevation (bfe). This improvement would result in levee stabilization and transformation of the levee into a continuous earthen platform. Once restoration improvements have been completed, the Mountain House Community Services District (MHCSD) would request a Letter of Map Revision (LOMR) from FEMA to determine the new extent of 100-year flood hazard zones in the vicinity of the project site (Karimoto, 2004). This proposal was evaluated in the Initial Study completed for Specific Plan II (SJCCDD, 2004).

Kelso Road Drainage Improvements

At the completion of project development, with the exception of a narrow fringe bordering Alameda County, runoff from portions of Neighborhood I that currently flow west to existing residences and other properties along Kelso Road would drain toward the interior of the Mountain House community. This would reduce the area draining to the Kelso Road area from approximately 330 to 80 acres, thereby significantly reducing flows in this area. Additionally, the proposed project includes the following drainage improvements to serve existing residences and other properties along Kelso Road: relocation of one of the existing pump stations (Pump Station 1) to a position in San Joaquin County adjacent to the county line, construction of a new drainage swale along the San Joaquin/Alameda County boundary, and construction of a swale from Kelso Road west along Old River. It is estimated that these improvements would

reduce 100-year flows to Pump Station 1 from 410 cubic feet per second (cfs) to 103 cfs, and to Pump Station 2 from 249 cfs to 57 cfs.

Farmland Irrigation

The Neighborhood I and J area is primarily agricultural land. As the area is developed, the existing farmland irrigation infrastructure would be abandoned and removed to accommodate the proposed neighborhoods. Remaining farmland would either become dry-land farmed or would continue to be irrigated through alterations to the existing irrigation system. Farmland irrigation supply and drainage issues as Mountain House builds out are described in a Farm Irrigation Report for each respective neighborhood. At the time of this Initial Study, Farm Irrigation Reports for Neighborhoods I and J had been prepared. Farm Irrigation Reports must be submitted to and approved by San Joaquin County Community Development with each Tentative Map.

Neighborhoods I and J are currently irrigated by water from Old River through irrigation pumps and a series of pipes and ditches. Development of Neighborhoods I and J would require the abandonment and removal of all irrigation infrastructure within these two neighborhoods.

Potential Irrigation with Reclaimed Water

The MHCSD wastewater treatment plant has been constructed as a secondary and tertiary treatment facility. Tertiary treatment is considered to be one of the highest levels of wastewater treatment. Title 22 of the California Code of Regulations allows the use of disinfected tertiary water for many uses, including landscape irrigation and agricultural irrigation of all food crops. While the use of secondary treated reclaimed water is somewhat restricted, it is considered suitable for most landscape irrigation and food crops where the edible portion does not touch the reclaimed water.

Wastewater generated by the development of Neighborhoods I and J may be disposed of in one or a combination of the following ways: (1) year-round discharge to Old River; (2) land reclamation (subject to permitting by the Central Valley Regional Water Quality Control Board [CVRWQCB]) on MHCSD parks, open space, and golf course areas; (3) distribution of reclaimed wastewater to users outside the limits of the MHCSD including nearby agricultural fields; and/or

(4) use by the East Altamont Energy Facility (EAEF) in Alameda County as cooling water.[1]

[1] The use of reclaimed Mountain House wastewater at EAEF has been addressed in an earlier environmental document entitled California Energy Commission. East Altamont Energy Center Final Commission Decision. August 2003 (P800-03-012).

Significant Impacts Identified in 1994 MEIR

The 1994 FEIR identified significant and potentially significant hydrological/water quality impacts of the Master Plan related to the following:

1) Increased sedimentation within Old River caused by runoff from Mountain House Creek and operation of the proposed marina [no longer relevant];[2]

2) Water quality problems associated with inadequate water circulation in the proposed on-site marina [no longer relevant];

3) Impacted water quality in Old River due to construction or proposed marina [no longer relevant];

4) Shallow groundwater conditions presenting adverse conditions for construction of foundations and detention/retention basins. The project could result in elevation of groundwater levels due to removal of subsurface drains;

5) Erosion of levees by waves generated by boat wakes as a result of increased boating within Old River and South Delta waterways and operation of the proposed marina [no longer relevant]; and

6) Deposition of sediment transported by Mountain House Creek and deposited within the project site, potentially interfering with flood control and the enhanced habitat function of the Mountain House Creek corridor. If transported to Old River, sediment could have adverse impacts on downstream water quality.

Findings Related to Significant Impacts Identified in 1994 MEIR

Project impacts associated with the construction of a marina are no longer relevant since this element has been removed from the project. As part of Specific Plan II, the formerly proposed marina land use has been converted to a regional and community park through the extension of the Old River Regional Park to the west by approximately one-half mile. This change in land use would reduce the potential negative impacts of project development on "waters of the state." A small public boat launch facility is proposed as part of the Old River Regional Park within Neighborhood K. However, this facility is significantly smaller and would not have water quality impacts such as those related to the marina that were identified in the 1994 MEIR and described above.

The following mitigation measures were adopted into the Master Plan to mitigate project impacts associated with erosion and sedimentation: (1) construction of sedimentation basins and other effective sediment control structures (i.e. water quality ponds) to effectively remove sediment associated with runoff from the project site (Policy 7.2.8j), and (2) development of a basin maintenance program that describes maintenance activities that would be necessary for continued effectiveness of basins (Policy 15.6a).

[2] The marina is no longer proposed as part of the Mountain House community.

The 1994 MEIR recommends that potential project impacts associated with shallow groundwater levels be mitigated through the preparation of a Preliminary Soils Report (i.e., Geotechnical Engineering Report) for each subdivision to determine seasonal groundwater levels and provide appropriate design recommendations (Section 6.8.3). At the time of this Initial Study, geotechnical engineering reports for Neighborhoods I and J had been completed.

Discussion Regarding Neighborhoods I and J

a) Violate any water quality standards or waste discharge requirements?

During project construction, grading operations would result in the removal of on-site soil cover and the exposure of soils to the erosional forces of rainfall and runoff. The project would be required to comply with the Phase I National Pollutant Discharge Elimination System (NPDES) permit program.

The site-specific plan to implement the erosion control BMPs is called the Storm Water Pollution Prevention Plan (SWPPP). The SWPPP would also include BMPs for preventing the discharge of other non-point source (NPS) pollutants (i.e., paint, concrete, petroleum hydrocarbons) from the project site during the construction period.

Upon project completion, water quality ponds (i.e., detention basins) in/or adjacent to the Mountain House and Dry Creek corridors, along with golf course/BMPs, would serve to treat storm water runoff from the project site prior to discharge to Old River. These BMPs would help to settle out sediment and particulates from runoff, as well as trace metals, nutrients and hydrocarbons, as these pollutants tend to adhere to soil particles.

The applicant is considering the option of using reclaimed water for irrigation of the golf course(s) and other public open space areas such as parks. Whether this option will be pursued is still unknown. Exact requirements and location of potential spray fields are not yet known. The use of reclaimed water for irrigation would be subject to RWQCB review to ensure no water quality standards are violated.

Master Plan Policy 15.7 (Implementation Measure [a]) states that Mountain House shall implement a storm water management program (SWMP) to reduce the discharge of pollutants from the storm sewer system to the maximum extent practicable and protect water quality in the receiving waters. At a minimum, the Master Plan states that the SWMP shall include the following elements: (1) public education and outreach on storm water impacts, (2) public involvement/participation, (3) illicit discharge detection and elimination, (4) construction site storm water runoff control, (5) post-construction storm water management, and (6) pollution prevention/good housekeeping for municipal operations. At the time of this Initial Study, a SWMP would be required prior to

construction of the project, but would be required prior to the onset of construction.

Issues related to water quality standards and waste discharge requirements are also addressed in the Master Plan in the following: Policies 7.2.8 (Implementation Measure [h]) and 7.2.8 (Implementation Measure [z]) (Mountain House Creek Park); Policy 7.3.6 (Implementation Measure [e]) (Wetlands Management); Policy 15.6 (Implementation Measure [a]) (Mountain House Creek Improvements); and Policy 15.7 (Implementation Measure [a]) (BMPs).

A Maintenance and Operations Manual must be prepared as required by the Master Plan. The Maintenance and Operations Manual shall describe sediment basin and water quality pond maintenance activities, including mosquito abatement, access and maintenance to access roads, desilting, vegetation clearing, and trash and debris removal, to ensure the continued maintenance of the ponds. This plan must be completed prior to approval of Tentative Maps for Neighborhoods I and J.

A post-development SWMP must be prepared as required by the Master Plan. The post-development SWMP must address (1) public education and outreach on storm water impacts, (2) public involvement/participation, (3) illicit discharge detection and elimination, (4) construction site storm water runoff control, (5) post-construction storm water management, and (6) pollution prevention/good housekeeping for municipal operations. This SWMP must be completed prior to approval of Tentative Maps for Neighborhoods I and J.

No additional mitigation measures would be necessary.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g. the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

The proposed project would result in a substantial increase in impervious surface areas and could reduce the amount of on-site aquifer recharge. However, groundwater quality in the vicinity of the project site is considered marginal, with relatively high levels of total dissolved solids (TDS), nitrates, and sulfides detected in wells in the area (SJCCDD, 1994).

The farmland surrounding the project site is irrigated primarily by agricultural drainage ditches and not by groundwater wells. Therefore, while project development would result in an increase in impervious surfaces over a recharge area, any slight change in groundwater levels would not affect surrounding farmland.

The Master Plan requires the evaluation of using reclaimed secondary and/or tertiary water for on-site and/or off-site landscape and/or agricultural irrigation. If this method of wastewater disposition is adopted, it could potentially increase groundwater recharge in the vicinity of the project site.

Finally, the water supply for the project site would be provided by the Byron Bethany Irrigation District (BBID). BBID's water supply is primarily from surface water sources. The installation of new wells is not a part of the proposed project and thus, little or no groundwater would be used for the project's water supply.

No mitigation measures would be necessary.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

Development of the proposed project would substantially alter the existing drainage patterns of the area in such a way that could result in erosion both during and after construction. During the construction period, grading operations would result in the removal of on-site soil cover and the exposure of site soils to the erosional forces of runoff. Under the Phase I NPDES permit requirements, the project applicant would be required to prepare a SWPPP to mitigate soil erosion and sedimentation resulting from construction activities.

Once the project is completed, the increase in impervious surface area resulting from project development would increase the amount of runoff leaving the project site. The on-site runoff, which currently occurs primarily as sheet flow and concentrated shallow flow across the agricultural fields to Mountain House Creek, Dry Creek, and Old River, would be concentrated and discharged at storm drain outfalls to water quality ponds in or adjacent to the Mountain House Creek and Dry Creek corridors, golf course/BMPs, lake/BMPs, or Water Quality Basin (WQB) 1. In locations where the velocity of discharge can be expected to cause erosion, erosion protection measures (i.e., concrete, rip rap, soil reinforcement products, etc.) would be used to prevent erosion and protect water quality, as addressed in the Master Drainage Plan (PACE, 2002).

Issues related to drainage and potential erosion/siltation are also addressed in the following: Master Plan Policies 15.3 (Implementation Measure [a]) (Off-Site Watersheds); 15.4 (Policies[b], [c], and [h]) (Primary Storm Drain Collection System); 15.6 (Policy [d], and Implementation Measure [a] (Mountain House Creek Improvements); 4.2.2 (Policies [a] and [d]) (Grading Standards); and 6.8.3 (Objective [b] and Policy [b] (Soils, Geologic and Seismic Hazards).

No additional mitigation measures are required to reduce potential project impacts related to erosion and siltation.

d) Substantially alter the existing drainage pattern of the site or area, including alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off-site?

Development of Neighborhoods I and J would substantially alter existing drainage patterns, increase the amount of impervious surface area, and result in an increase in volumetric runoff from the development area. According to the Storm Water Master Drainage Plan Update (PACE, 2006), project development would result in a volumetric increase runoff volume for the 100-year 24-hour storm in Mountain House Creek and Dry Creek, respectively. However, the restoration improvements completed for Mountain House Creek and the proposed detention basins adjacent to Dry Creek would result in an increase in flood capacity and result in 100-year flood protection throughout the creek channels based on project build-out projections. For Mountain House Creek, this has been accomplished by deepening the stream center lines, widening the stream channels, and constructing stream sections that include flood plains.

Additional flood storage would be provided by the interconnected golf course water features in Neighborhoods I and J. This additional flood storage, coupled with restoration improvements to Mountain House Creek and the placement of engineered fill behind the existing levee along Old River, would remove all development areas in Neighborhoods I and J from the 100-year flood hazard zone. Therefore, project development would not result in on-site flooding.

Post-development drainage patterns and drainage infrastructure would reroute runoff from 250 of the total 330 acres currently draining to existing residences and properties along Kelso Road towards the interior of the Mountain House development. Changes in drainage patterns and proposed infrastructure on- and off-site would reduce runoff to this area by approximately 75 percent during the 100-year storm event. There are no other structures or properties in the vicinity of the project site that could experience flood problems due to project development. Therefore, project development would not result in an increase in off-site flooding. It should be noted that the 10 existing residences located inside the Old River levee would be incorporated into the Neighborhood I area and would remain in the 100-year floodplain of Old River. Project development would not increase flood hazards for these homes.

Issues related to potential flooding are also addressed in the following Master Plan policies: 4.3.1 (Policy [e]) (Community Edges); 5.1.4 (Policy [d]) (School Siting Criteria); 6.5 (Implementation Measure [b]) (Emergency Preparedness); 7.2.8 (Objective [c], Policies [a] and [e], and Implementation Measures [a[and [g]) (Mountain House Creek Park); 15.4 (Policy [a]) (Primary Storm Drain Collection System); 15.5 (Policy [a]) (Secondary Storm Drain Collection System); 15.6 (Policy [a] and Implementation Measures [a](1) and [a])(9)) (Mountain House Creek Improvements); 15.8 (Flood Protection); and 15.11.2(a) (Operations and Maintenance).

No additional mitigation measures are required related to on- and off-site flooding.

e) Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted runoff?

Runoff quantity and the adequacy of the storm water drainage system are addressed above under (d). Due to the current agricultural land uses at the project site, it is likely that the non-point source (NPS) pollutants currently found in site runoff are sediment, nutrients, pathogens, and oxygen-demanding solids. While conversion of the site from agricultural uses to suburban uses would likely result in a decrease in sediment and nutrients in site runoff, the conversion would likely result in an increase in the levels of oils, grease, metals, and petroleum hydrocarbons. Typical sources of such NPS pollutants in suburban environments include household products and home maintenance supplies, landscape chemicals, automobiles, and fuels. Due to the change in land use and the size of the development, the anticipated increase in oil, grease, metals, and petroleum hydrocarbons would likely be substantial.

As described earlier in this section, all "urban" water originating from the project site would be treated in water quality BMPs prior to discharge to Mountain House Creek, Dry Creek, and Old River. Water quality BMPs would allow for the settlement of sediments and particulates, as well as trace metals, nutrients, and hydrocarbons that tend to adhere to soil particles. The MHCSD has prepared a water quality BMP manual (PACE, 2006) that provides storm water quality guidelines that may be implemented in some areas of the project site.

Issues related to runoff quality and quantity are also discussed in the following: Master Plan Policies 7.3.6 (Implementation Measure [e]) (Wetland Management) and 15.7 (Implementation Measures [a], [c], [d], [e], [g[, [h], and [i]) (BMPs).

Project impacts related to runoff quality and quantity are considered less than significant due to mitigation measures in the project description. No additional mitigation measures are necessary.

f) Otherwise substantially degrade water quality?

The MHCSD is evaluating the feasibility of using reclaimed water for on-site and/or off-site irrigation. Reclaimed water from Mountain House would go through secondary and/or tertiary treatment prior to being used for landscape and/or agricultural irrigation and would aid in the conservation of freshwater and potable water resources. Any use of reclaimed water would be in accordance with Title 22 of the California Code of Regulations and would be subject to discharge permits granted by the Central Valley RWQCB, both on-site and off-site.

Even with tertiary treatment, wastewater generally has elevated levels of salts, nitrates, trace level organic contaminants, and suspended solids. As compared with the direct discharge to surface waters, use of treated wastewater for irrigation has the potential to aid in removal of some of these organic chemicals by exposing them to a variety of methods of biodegradation, assimilation, or transformation. Thus, the potential use of reclaimed water for the irrigation of landscape and/or agricultural areas would be preferable to direct discharge to surface waters and would not result in a substantial degradation of water quality.

No mitigation measures are necessary. If and when the applicant decides to use reclaimed wastewater for irrigation, applicable permits from the Central Valley RWQCB would be required to ensure that water quality standards are met.

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

Current FEMA maps for San Joaquin County indicate that approximately one square mile of Neighborhoods I, K and L is located within the 100-year flood hazard zone for Old River. The current 100-year flood elevation for Old River is approximately 8 feet above mean sea level (MSL). Elevations along the northern end of Specific Plan II (which includes Neighborhoods I, K and L) are 0 feet above MSL.

Proposed improvements to the Old River levee involve the placement of engineered fill behind the levee to stabilize the levee and elevate building pad elevations above the 100-year flood hazard zone for Old River. At a minimum, all future elevations behind the levee would be raised above the existing 8-foot flood elevation. Cut and fill volumes behind the existing levee are expected to be equal and are approximately 5,000,000 cubic yards. The earthwork quantity does not include grading for Mountain House Creek, the industrial park, the wastewater treatment plant, or the water treatment plant (CBG, 2004).[3] These improvements would result in the transformation of the existing levee into a continuous earthen platform that gradually blends with existing ground elevations to the south. These improvements would result in the removal of all portions of Mountain House from the 100-year flood hazard zone, and would be consistent with the approved Conditional Letter of Map Revision (CLOMR) issued by FEMA on November 29, 2005. The property will be formally removed from the 100-year floodplain upon a civil engineer certifying the final pad elevations after grading. Therefore, the proposed project would not result in negative impacts associated with a 100-year flood hazard area and no additional mitigation measures are required.

[3] The Old River Industrial park, the wastewater treatment plant, and the water treatment plant are all outside of Neighborhoods I and J.

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

See the discussion under Items (d) and (g) above.

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

The proposed project includes the stabilization of the existing levee along Old River. Once engineered fill has been placed behind the levee, the potential failure of this levee would no longer be an issue. Additionally, improvements to Mountain House Creek were designed to convey the 100-year storm event and to accommodate runoff resulting from a sudden and complete failure of both earthen dams located upstream of the project site, in Alameda County.

Existing residences located on the inside of the Old River levee would remain in the 100-year floodplain of Old River (see Figure 3-6). Project development would not result in increased flood hazards at this location. The proposed project would not expose people or structures to flood hazards as a result of the failure of a levee or dam. No additional mitigation measures are required to reduce project impacts related to levee or dam failure.

j) Inundation by seiche, tsunami, or mudflow?

A seiche is a rhythmic motion of water in a partially or completely landlocked water body caused by landslides, earthquake-induced ground accelerations, or ground offset. Under Specific Plan II, Neighborhoods I and J would include landlocked water features. However, these water features would wind through the neighborhoods and would not be large enough to pose a threat of inundation by seiches. The project site is not situated in an area that is vulnerable to tsunamis or mudflows. Therefore, project impacts related to inundation by seiche, tsunami, or mudflow are considered less than significant. No mitigation measures are necessary.

Sources of Information

Condor Earth Technologies, April 2004b. *Geotechnical Engineering Study, Neighborhood I, Mountain House, California.*

Condor Earth Technologies, April 2004c. *Geotechnical Engineering Study, Neighborhood J, Mountain House, California.*

Department of Water Resources (DWR), 1975. California Groundwater – Bulletin 118, Draft Groundwater Descriptions. (Update 2002.)

Federal Emergency Management Agency (FEMA), 1996. *Q3 Flood Data ARC/INFO Coverage – San Joaquin County, California.*

Karimoto, Derek, Civil Engineer, Pacific Advance Civil Engineering (PACE), Inc., 2004. Telephone conversation with Kelly White, Questa Engineering, April 21.

Pacific Advanced Civil Engineering (PACE), Inc., 2002. *Master Drainage Plan.* April.

Pacific Advanced Civil Engineering (PACE), Inc., 2004a. *Kelso Road Conceptual Drainage and Grading Study.* April.

Pacific Advanced Civil Engineering (PACE), Inc., 2004b. *Storm Water Master Plan Update, Addendum I.* May.

Pacific Advanced Civil Engineering (PACE), Inc., 2006. *Storm Water Master Plan Update, Addendum II.* September 28.

San Joaquin County Community Development Department (SJCCDD), 1994. *Mountain House Master Plan Final Environmental Impact Report.*

San Joaquin County Community Development Department (SJCCDD), April 2003. *Mountain House Villages E and G Project Expanded Initial Study (Draft)*. April.

San Joaquin County Community Development Department (SJCCDD), 2004. *Mountain House Specific Plan II Initial Study*. December.

United States Department of Agriculture (USDA), 1999. *Soil Survey Geographic (SSURGO) Database for San Joaquin County, California* [Arc/Info Coverage].

United States Department of the Interior Geological Survey, 1978. *Clifton Court Forebay Quadrangle 7.5-Minute Series* [Topo Map].

Western Regional Climate Center, 2002. *Period of Record Monthly Climate Summary, Tracy Pumping Plan, California.* Online. September 23, 2002. Available: http://www.worldclimate.com/cgi-bin/data.pl?ref=N37W121+2200+049001C.