3.6. HYDROLOGY AND WATER QUALITY

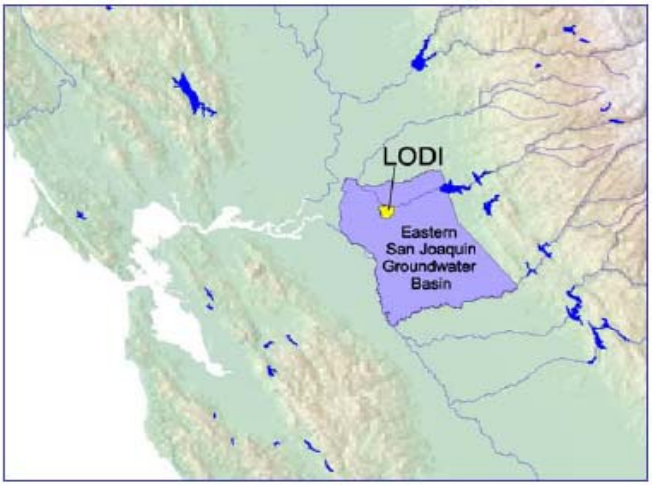
3.6.1. INTRODUCTION

This section examines the proposed project to determine if it would directly or indirectly affect the hydrology and water quality of the project site and region. The hydrology parameters examined include drainage patterns, surface flow, flooding, water quality, and groundwater recharge. This section of the EIR is based on information found in the City of Lodi General Plan (1991), and the Lodi South, California, 7.5-Minute United States Geological Survey (USGS) Topographic Quadrangle.

3.6.2. REGULATORY FRAMEWORK

Local Hydrology

FIGURE 3.6-1: EASTERN SAN JOAQUIN GROUNDWATER BASIN *(SOURCE: CITY OF LODI DRAFT SURFACE WATER SUPPLY OPTIONS, 2003)*



Lodi is located in the central, northern portion of San Joaquin County, in the Central Valley of California, approximately 6.5 miles north of Stockton and 35 miles south of Sacramento, adjacent to U.S. Highway 99. It covers an area of 10.4 square miles. Lodi is part of the Eastern San Joaquin Groundwater Basin (Figure 3.6-1). Lodi, as well as the entire Central Valley, is underlain by alluvial soils deposited by runoff from surrounding mountain ranges. The alluvial layers below Lodi, as well as the proposed project area, are part of the major aquifer system that extends the length of the valley. Locally, the aquifer is recharged by the Mokelumne River, which borders the City of Lodi to the north, and is the principal surface water feature in the project vicinity. Impoundment of the Mokelumne River at Woodbridge forms Lodi Lake, which serves as a diversion for the Woodbridge Irrigation District (WID) South Main Canal, which provides irrigation water to agricultural land west and south of Lodi.

Drainage

Drainage and flood control facilities in the project area are maintained by the City of Lodi. The City of Lodi municipal storm drainage system consists of an integrated system of trunk lines, detention basins, and pump stations. Surface infrastructure such as gutters, alley, and storm ditches provide for collection of stormwater into the system. The city's stormwater drainage system includes 16 storm outlets to the Mokelumne River, Lodi Lake, or the WID Canal. Since most of the drainage area slopes away from the Mokelumne River toward the southwest, the majority of the city's drainage would

eventually discharge into the WID Canal. The City of Lodi maintains 110 miles of stormwater collection and conveyance piping. The WID Canal receives water for a significant portion of the City's stormwater. The Storm Drainage Discharge Agreement between the City and WID serves as the governing document between the two entities and allows the City to discharge stormwater into WID Canals for 40 years. The City is limited to discharging 160 cubic feet per second (cfs), as a maximum winter discharge rate. The maximum winter rate per discharge site is 60 cfs. During the summer, WID uses the canal for irrigation purposes. Therefore, the City's discharge rate is reduced to a maximum of 40 cfs total, not to exceed 20 cfs per discharge site. Giving WID notice 12 hours prior to discharge can increase this. Several stormwater detention basins are operated by the city to control runoff for events up to a 100-year storm. These detention basins also function as sports facilities (baseball fields, soccer fields, etc.), but their primary purpose is flood control. Forty-five (45) storm pumps, operating at 14 pumping stations, service Lodi's stormwater system. The City also maintains a portable generator for emergency use.

Drainage facilities proposed within the City of Lodi are required to be designed and constructed to the City of Lodi standards.

Water Quality

Section 402 of the Clean Water Act regulates the degradation of water quality. This regulation established the National Pollution Discharge Elimination System (NPDES), which is enforced in the project area by the Central Valley Regional Water Quality Control Board (RWQCB).

Section 402 prohibits the unauthorized discharge of pollutants from a point source (pipe ditch, well, etc.) to U.S. waters, including municipal, commercial, and industrial wastewater discharges and discharge from large animal feed operations. In addition to point source polluters, the NPDES manages non-point source pollutants by requiring local governments to obtain an NPDES Permit for municipal stormwater and urban runoff discharges in their jurisdiction. The primary objectives of these permits are to:

- Effectively prohibit non-stormwater discharges, and
- Reduce the discharge of pollutants from stormwater conveyance systems to the Maximum Extent Practicable (MEP).

In California (in accordance with the Porter-Cologne Act) the Regional Water Quality Control Boards (RWQCB) of the State Water Resources Control Board (SWRCB) administers NPDES Permits for municipal stormwater, called Municipal Separate Storm Sewer Systems (MS4) permits. The City is required to develop and implement a Stormwater Management Program (SMP) that describes best management practices (BMPs), measurable goals, and timetables for implementation in six program areas:

- Public education and outreach,
- Illicit discharge detection and elimination,

- Public participation/involvement,
- Construction site runoff control/post-construction runoff control, and
- Pollution prevention/good housekeeping.

Additionally, the MS4 must reduce its discharge of pollutants to the Maximum Extent Practicable (MEP) and perform inspections and monitoring.

The pollutant load reductions, resulting from BMP implementation, will help ensure that the City meets NPDES requirements and that the Mokelumne River water will be a protected source, suitable for drinking water supply for years to come.

The intent of the SMP is to ensure that municipal stormwater outflows do not cause their receiving waters to exceed water quality standards. Water quality standards consist of designated beneficial uses (such as drinking, swimming, or boating) and water quality objectives. Thus, the SMP is designed to achieve compliance with the receiving water's limitations. As described in the MS4 permit the following types of development projects must submit a plan that demonstrates how the development will comply with the City's BMPs. The following table, Table 3.6-1, is a brief description of the BMPs (See Table 3.6-1).

TABLE 3.6.1: GENERAL BMP DESCRIPTION

BMP	Discussion
BMP Inspection and Maintenance	BMP inspection is necessary to ensure BMPs are in proper working order. Generally, inspection and maintenance of BMPs can be categorized into two groups, expected routine maintenance and non-routine (repair) maintenance.
Class Education	The classroom education BMP involves a variety of activities to promote stormwater awareness in local classrooms.
Community Car Washing	This practice involves educating the public, businesses, and municipal fleets regarding the water quality impacts of the outdoor washing of automobiles and how to avoid allowing polluted runoff to enter the storm drain system. The City has chosen to pay special attention to the potential impacts of fundraising type carwashes.
Community Educational Efforts	Community education is key to the success of the Plan. The program will address this BMP through a variety of means, including pamphlets, local media, mailers, and classroom contact.
Community Hotline	Community hotlines provide a means for concerned citizens and agencies to contact the appropriate authority when they see water quality problems
Contractor/Inspector Training	Ensuring that contractors and inspectors are properly trained is key to proper BMP implementation. Contractor training can be accomplished through municipally-sponsored training courses, or more informally through mandatory preconstruction or prewintering meetings and regular and final inspection visits to transfer information to contractors.
Detention Ponds	This BMP will ensure that the City continues to use existing detention basins in their stormwater protection strategy.

BMP	Discussion
Disposal of Chlorinated Water	Chlorinated water discharged to surface waters has an adverse impact on local water quality. Proper disposal of chlorinated water can include dechlorination before discharge and/or discharge to the sanitary sewer system.
Erosion Control for Construction	Erosion control for construction will be approached through a variety of mechanisms, including construction entrances, tire wash facilities, outlet protection, check dams, sediment barriers, inlet protection, and concrete washouts
Floatable Debris Control Program	Floatable debris represents a significant source of pollution within the City. The City will begin by identifying the sources of floatable material in stormwater. The program will then be expanded to control the amount of material in the outflow of the system.
Grass-lined Swale	Grass-lined swales are a series of vegetated, open channels designed specifically to treat and attenuate stormwater runoff for a specified water quality volume.
Illicit Discharge Detection and Control Programs	The objective of an illicit discharge investigation program is to identify and eliminate the discharge of pollutants to the stormwater drainage system. Controlling illicit discharges provides important public health benefits as well as ecosystem protection.
Inlet/Outlet Protection	The BMP helps ensure pollutants will be stopped from entering the stormwater system and the natural environment.
Lodi Municipal Code	The current sections of the Lodi Municipal Code do not adequately address the Phase II requirements. For that reason substantial changes to the Code will be required.
Storm Drain Cleaning	Storm drain systems need to be cleaned regularly in order to maintain their ability to trap sediment and prevent flooding.
Storm Drain Detectives	Storm Drain Detectives is a collaborative effort of the City of Lodi Public Works Department, State Water Resources Control Board-Division of Water Quality, Lodi Lake Nature Area Docent Council, and four local high schools. Monthly monitoring of nine locations along the Mokelumne River and Lodi Lake is done by trained volunteers.
Street Cleaning	This management practice involves employing pavement cleaning practices such as street sweeping on a regular basis to minimize pollutant export to receiving streams.
Urban Forestry	Urban forestry is the practice of establishing and maintaining trees and forests in and around towns and cities. Since trees absorb water, patches of forest and the trees that line streets can help provide some of the stormwater management required in an urban setting.

Source: *City of Lodi Stormwater Management Program (2003)*

3.6.3. ENVIRONMENTAL SETTING

Regional Drainage

FIGURE 3.6.2: CENTRAL VALLEY REGIONAL WATER BOARD

The Central Valley Regional Water Board governs the Central Valley, which stretches from the Oregon border to the northern tip of Los Angeles County and includes all or part of 38 of the State's 58 counties (shown in figure 3.6-2). Three major watersheds have been delineated within this region: the Sacramento River Basin, the San Joaquin River Basin and the Tulare Lake Basin. The three basins cover about 40 percent of the total area of the State and approximately 75 percent of the irrigated acreage. Surface water supplies tributary to or imported for use within the Central Valley, particularly the San Joaquin River and Tulare Lake basins, are inadequate to support the present level of agriculture and other development; therefore, groundwater resources within the valley are being mined to provide additional water to supply demands. The Sacramento and San Joaquin River Basins are bound by the crests of the Sierra Nevada on the east and the Coast Range and Klamath mountains on the west. They extend over some 400 miles. The Sacramento and San Joaquin River Basins cover about one fourth of the total area of the State and contain over 43 percent of the State's irrigable land. Surface water from these two basins meet and form the Delta, which ultimately drains to San Francisco Bay. Major groundwater resources underlie both river valley floors.

The San Joaquin River Basin covers 15,880 square miles. The principal streams in the basin are the San Joaquin River and its larger tributaries: the Cosumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. Major reservoirs include Pardee, New Hogan, Millerton, McClure, Don Pedro, and New Melones.

The Mokelumne River drains a portion of the central western slope of the Sierra Nevada Mountains to the Sacramento Delta and serves as a source of water supply for a large portion of Northern California.

The majority of the western and southern portion of Lodi's out fall, however would occur south of the Mokelumne River, at the WID South Main Canal.

Existing Drainage of the Project Site

Existing stormwater management and collection systems were developed for and serve the agricultural uses currently developed in the project area and are inadequate to meet the needs of the proposed project. In addition, the City's current systems cannot provide service for the project area at this time.

The site falls approximately 5 feet from the northeast corner of the property to the southwest corner of the property. There are no significant drainage channels through the site. There is a single drainage swale in the northeastern corner of the study area. The drainage swale receives water from the north via a culvert beneath Harney Lane and channels it east towards State Route 99. There is also an excavated ditch that parallels a portion of the Union Pacific Railroad on the south, and borders the western edge of the project area. The drainage swale and the excavated ditch do not convey water to or from jurisdictional "waters of the U.S." outside the project area.

Floodplains

The levee system along the Mokelumne River is of sufficient height to protect the proposed project area from a 100-year flood; however, according to flood insurance rate map (FIRM) 06033 for the City of Lodi and map 060299 for San Joaquin County a 500-year flood would inundate most of the area, according to the Federal Emergency Management Agency (FEMA 2005).

Water Quality

The only water pollutants that could be released from the project site include runoff induced sediment, vehicle and equipment fluids, household chemicals, trash, landscaping byproducts, and other typical urban stormwater pollutants. The NPDES was established to regulate stormwater pollution. In accordance with NPDES, San Joaquin County and the City of Lodi has implemented a Stormwater Management Plan (SMP) for urban runoff.

The SMP is a regional plan designed to reduce the pollutant levels of receiving waters. Thus, the plan is intended to achieve a cumulative reduction in water pollutants. Future developments within the Project area are required to submit a plan that demonstrates how the development will comply with the SMP.

Groundwater

The project site is within the Eastern San Joaquin Groundwater Basin, which is an integral, interconnected part of the Central Valley Groundwater Basin. The groundwater in the basin is contained in the Mehrten formation and overlying younger aquifer units below the City. The aquifer underlying Lodi is largely unconfined. Groundwater is encountered nearest to the surface in the northwestern portion of Lodi near Woodbridge at approximately 20 feet below ground surface, but is approximately 60 feet below ground surface at the project area. Primary sources of recharge to the aquifer underlying Lodi include seepage from the Mokelumne River, deep percolation of rainfall,

regional sources including the Delta and along the Sierra mountain-front, and percolation of irrigation water particularly in the areas which use surface water from the WID.

3.6.4. PROPOSED CONDITIONS

Storm Drainage

After annexation, stormwater management will be the responsibility of the City of Lodi for the project area.

After careful review of the development plan, a stormwater implementation plan was developed. The site was divided into manageable shed areas in accordance with the land use and storm water discharges were developed in accordance with City of Lodi standards and general engineering practices. A stormwater pipe network was developed to convey the anticipated discharges (see Figure 3.6.3.) Although the proposed system clearly meets the needs of the project, a more refined study will be required as part of the process to develop construction drawings. The study will be based on project level details that are currently unavailable.

The 100-year storm volume will be collected and retained on site for a time (one to three days) in a single detention basin with a volume of 48 acre-feet, located at the southwest corner of the project site. The selection of this site was based on the topography of the site and the opportunity to minimize excavation for this facility. The basin will be designed in conformance with City standards, which will include a service road, six to one side slopes and other needed facilities. The facility will integrate pedestrian and bicycle facilities that do not interfere with the storage requirements of the basin.

A smaller interim basin is being considered to serve the first phase of the project on an interim basis as a means to expedite Phase 1 and to reduce the costs of the initial phase. If this facility is constructed, it will meet the standards of the City of Lodi. The interim facility would be restored to original condition when the permanent basin is constructed.

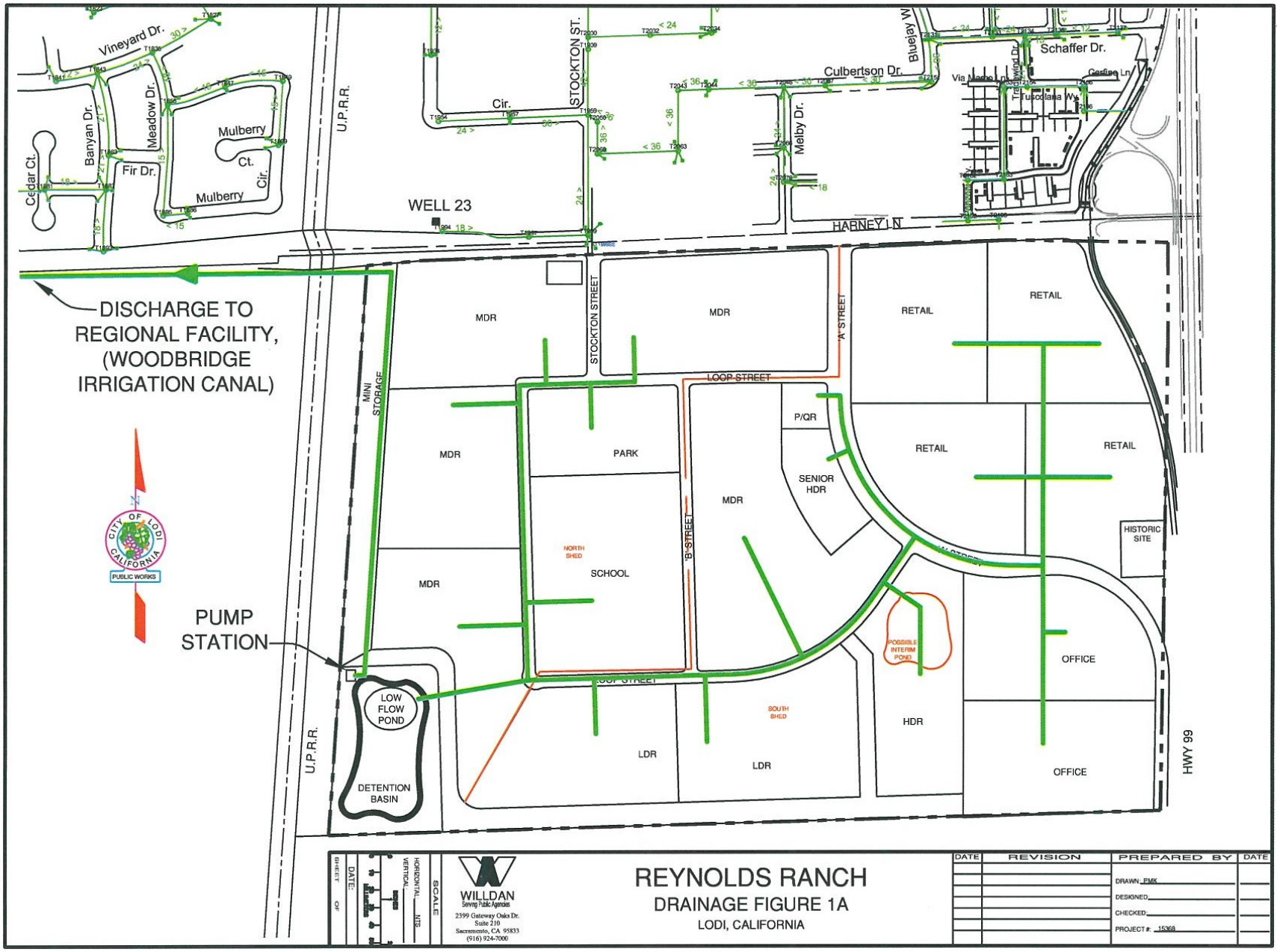
The detention basin will be discharged by a metered outfall into the Woodbridge irrigation canal, which runs about 3900 ft west of the project site. A pipeline will be constructed from the detention basin to the canal and a pump station will be designed to meet the requirements. The pump is designed to empty the basin within three days after the storm. The pipeline to the pump station would be 12 to 18 inches in diameter allowing the pumps to deliver approximately 8 cubic feet per second (cfs).

Woodbridge Irrigation District and the City of Lodi have a long established agreement that provides for the discharge of storm runoff into the District canal system. The City has been granted the right from Woodbridge Irrigation District to discharge storm drainage as follows:

Off season (no irrigation)	160 cfs
On season (irrigation in use)	
12 hours after a storm	40 cfs
Other times	60 cfs

The City has two existing discharge stations and is allowed three stations. Most major storms occur off-season and the systems generally provide for 100-year storage, these limitations are unlikely to be a constraint. Even in the event that storms occur during the irrigation season, the ability to retain flow will provide the flexibility needed to operate the system.

FIGURE 3.6.3: DRAINAGE PATTERN FOR REYNOLDS RANCH



3.6.5. THRESHOLDS OF SIGNIFICANCE

The State CEQA Guidelines state that a proposed project may have a significant impact on hydrology if it:

- Places 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;

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

- Exposes 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;

- Creates or contributes runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provides substantial additional sources of polluted runoff;

- Violates any water quality standards or waste discharge requirements;

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

- Substantially alters the 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.

- Otherwise substantially degrades water quality; or

- Substantially depletes groundwater supplies or interferes substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level;

3.6.6. PROJECT IMPACTS

No Impact

Placement of 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

The proposed project would not place housing within a 100-year flood hazard area identified on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map because, according to the most recent FEMA mapping available on FIRM 06033 for the City of Lodi and map 060299 for San Joaquin County, the project is located outside of the of 100-year flood hazard area.

Place Within a 100-Year Flood Hazard Area Structures which Would Impede or Redirect Flood Flows

According to the most recent FEMA mapping, FIRM 06033 and 060299, the proposed project site is not located within the 100-year flood hazard zone, and therefore, no placement of structures in a flood hazard zone would occur under the proposed project.

Inundation by seiche, tsunami, or mudflow

The proposed project would not be subject to inundation by a seiche, tsunami, or mudflow because the proposed project is not located near a significant body of water.

Impact 3.6.1: Risk of Flooding as a Result of the Failure of a Levee or Dam – Less than Significant Impact: Failure of water supply and/or flood control facilities along the Mokelumne River, including Pardee Dam, Camanche Dam, and the Camanche Dikes, could cause inundation of the project site.

There are many major dams in the region, which maintain river flows and reservoir levels to protect the San Joaquin Delta from unmanageable flows. Occasionally, heavy winter rains and combinations of snowmelt can cause flows to increase beyond the maximum channel capacities. This results in flooding of Delta Islands and communities along the west side of the county.

A major threat is the large volume of water stored in reservoirs by dams in the watersheds of the Mokelumne, Calaveras, and Stanislaus River systems. Catastrophic failure of any one dam along one of these rivers could cause inundation of vital farmland, livestock, cities, and rural residences. There are 14 major dams that could cause serious flooding should they incur a partial failure or complete failure. Recognizing the potential for economic and human losses, it is important to prepare and to plan for even the most remote event posed by the system of dams affecting San Joaquin County. Dam failure plans and emergency action protocols are in place and play an important role in minimizing or eliminating losses in the county due to such events.

Failure of the water supply and/or flood control facilities along the Mokelumne River, including Pardee Dam, Camanche Dam, and the Camanche Dikes, could cause inundation of the project site and, in some scenarios, inundate the entire City of Lodi. The East Bay Municipal Utility District (EBMUD) prepared an *Emergency Action Plan (EAP) for the Lower Mokelumne River Project* in 2000. The purpose of the EAP is "to define actions to be taken in the event of a dam break and to assist responsible EBMUD personnel and emergency response agencies in their actions to safeguard the lives and reduce damage to the properties along the Lower Mokelumne River." This EAP identifies the following inundation scenarios for the project site:

- In the "Pardee Dam Probable Maximum Flood Simulation" the project site would be inundated with water at a maximum height of 12-15 feet, which would occur with 50 to 53 hours of lead time. In the "Pardee Dam Fair Weather Flood Simulation" the project site would not be inundated.

- In the "Camanche Main Dam Probable Maximum Flood Simulation" the project site would be inundated with water at a maximum height of 12 feet, which would occur with 56 to 59 hours of lead time. In the "Camanche Main Dam Fair Weather Flood Simulation" the project site would be inundated with water at a maximum height of 9-12 feet, which would occur with 9 to 12 hours of lead time.

- In the "North Camanche Dikes Probable Maximum Flood Simulation" the project site would be inundated with water at a maximum height of 6-9 feet, which would occur with 56 to 62 hours of lead time. In the "North Camanche Dikes Fair Weather Flood Simulation" the project site would not be inundated.

- In the "South Camanche Dikes Probable Maximum Flood Simulation" the project site would be inundated with water at a maximum height of 6-9 feet, which would occur with 59 to 62 hours of lead time. In the "South Camanche Dikes Fair Weather Flood Simulation" the project site would be inundated with water at a maximum height of 6 feet, which would occur with 15 to 21 hours of lead time.

These flooding conditions represent the worst possible scenario brought on from an extreme event, such as an earthquake, major flood, etc. Even in the worst possible scenarios, inundation lead times at the project site indicate that the greatest potential flooding risks would be for property damage rather than for loss of life. Given the likelihood of a cataclysmic event, the historical performance of the facilities, and the EAP that would be initiated by EBMUD, the flooding risk associated with the water supply/flood control facilities along the Mokelumne River have been determined to be acceptable; and these risks are no greater on the project site than they are throughout the City of Lodi. There are no feasible project-specific mitigation measures available to decrease this risk.

Impact 3.6.2: Stormwater Drainage System Capacity and Polluted Runoff – Less than Significant After Mitigation: The proposed project would replace the existing informal and/or non-existent drainage system onsite with an engineered drainage system. With the proper design the proposed drainage system will have adequate stormwater capacity and would not be a substantial source of polluted runoff.

The project would contribute runoff water to the existing and planned stormwater drainage system. Runoff generated from the proposed commercial development may contain pollutants. Potential water pollutants that could be generated from the project site include runoff induced sediment, construction-generated pollutants, vehicle and equipment fluids, household chemicals, trash, landscaping byproducts, and other typical urban stormwater pollutants.

As discussed, the proposed project includes an engineered drainage system to manage stormwater flows on the project site. The proposed drainage system is designed to collect the site's stormwater in a detention basin prior to piping the stormwater to the WID canal. The proposed drainage system and detention basin allow the quantity and quality of stormwater to be managed prior to its outflow. Since the proposed drainage system has not yet been designed to a construction-drawing detail, Mitigation Measures 3.3.1 – 3.3.6 are needed to ensure the final drainage plans are designed to adequately manage the quantity and quality of stormwater prior to discharge into WID canal drainage facilities. The proposed preliminary design of the drainage system, however, clearly demonstrates that acceptable stormwater outflows from the proposed project would be attainable. Therefore, with the incorporation of Mitigation Measures 3.3.1 – 3.3.6, the proposed project would not cause an exceedance of the capacity of stormwater drainage systems and would not be a substantial source of polluted runoff.

Impact 3.6.3: Water Quality Standards or Waste Discharge Requirements – Less than Significant: The proposed project has the potential to generate water pollutants from construction and from typical urban land uses. Complying with existing requirements ensures the project would not affect the beneficial uses of any receiving waters.

The proposed project would not violate any water quality standards or exceed waste discharge requirements. None of the proposed uses are point source generators of water pollutants, and thus, no quantifiable water quality standards would apply to the project. However, as an urban development, the proposed project would add typical, urban, nonpoint-source pollutants to stormwater runoff. These pollutants include sediment, household chemicals, trash, landscaping byproducts, and vehicle fluids.

The project also has the potential to generate water pollutants during construction. Grading and construction of the proposed project would temporarily expose unvegetated soils. Such exposed soils are prone to erosion during storm events. If a storm event occurs while soils are exposed, the project could increase the sediment load in on-site and downstream runoff. Another concern for water quality during construction is accidental spillage of vehicle or equipment fluids, which can contaminate receiving waters.

The project's potential release of nonpoint-source urban pollutants, and construction-generated pollutants, are subject to Section 402 of the Clean Water Act and the National Pollution Discharge Elimination System (NPDES). Accordingly, the City of Lodi has implemented a Stormwater Management Plan (SMP) to address potential construction and post-construction impacts.

The proposed project would disturb more than one acre of land during construction and would therefore be required to file a Notice of Intent (NOI) with the California Regional Water Quality Control Board (CRWQCB) to be covered under the state's NPDES General Construction Permit for discharges of stormwater associated with construction activity. A developer must propose control measures that are consistent with the State General Permit. A Stormwater Pollution Prevention Plan (SWPPP) must be developed and implemented for each site covered by the general permit. A SWPPP should include Best Management Practices (BMPs) designed to reduce potential impacts to surface water quality during the construction of the project. Refer to section 3.6.2, Table 3.6.1. Thus, compliance with the State's NPDES General Construction Permit ensures the project's potential to release construction-generated stormwater pollutants is not a significant impact.

In accordance with the City's SMP, the proposed project must implement best management practices (BMPs) that prevent or minimize water quality impacts. Such BMPs include structural improvements, such a catch basin filters, oil/water separators, sediment traps, and sedimentation basins, as well as non-structural practices, such as education, maintenance, street cleaning, and other programs. Implementing BMPs in accordance with the City's SMP ensures that the project's potential to generate typical urban water pollutants would not be a significant impact.

Impact 3.6.4: Alteration of 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 Offsite – Less than Significant Impact: The proposed project would alter the site's drainage pattern. However, the proposed drainage of the site would not induce erosion or siltation.

The proposed project would not result in substantial erosion or siltation on- or off-site, and the project would have no related significant impacts. The project site does not contain any discernable watercourses, topographical depressions, or bodies of standing water. Thus, the project would not alter the course of a river or stream. However, the proposed project would develop commercial uses with associated roadways and infrastructure on a currently undeveloped, approximately 60-acre site and would provide the framework for the development of the balance of the 220-acre project site. The installation of impermeable surfaces including roadways, driveways, parking lots, and structures will increase the volume and velocity of stormwater runoff from the site, which can increase erosion and siltation.

As discussed, the proposed project includes an engineered drainage system to manage stormwater flows on the project site. The proposed drainage system is designed to collect the site's stormwater in a detention basin prior to piping the stormwater to the WID canal. The proposed controlled drainage system and detention basin largely

eliminates the erosion and siltation potential of the site's stormwater. Therefore, although the proposed project would alter the site's drainage pattern, the project would not result in significant erosion or siltation impacts.

Impact 3.6.5: Alteration of 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 – Less than Significant After Mitigation: The proposed project would alter the site's drainage pattern. However, with the proper design of the proposed drainage system, the proposed drainage pattern change would not result in on- or off-site flooding.

The project site does not contain any discernable watercourses, topographical depressions, or bodies of standing water. Thus, the project would not alter the course of a river or stream. However, the proposed project would develop commercial uses with associated roadways and infrastructure on a currently undeveloped, approximately 60-acre site and would provide the framework for the development of the balance of the 220-acre project site. The installation of impermeable surfaces including roadways, driveways, parking lots, and structures would increase the volume and velocity of stormwater runoff from the site. However, as discussed, the proposed project includes an engineered drainage system to manage stormwater flows.

The proposed drainage system is designed to collect the site's stormwater through a series of surface flows, catch basins, and storm drains. The proposed drainage system, as shown in Figure 3.6.3, would divert surface flows to the project's streets and parking lots, where it would then flow into storm drains. The proposed storm drains would convey the site's stormwater to the southwest corner of the site where it would be discharged into the proposed detention basin. The proposed detention basin would allow for a controlled discharge into a new storm drain, which would ultimately outflow into the WID canal.

Since the proposed drainage system has not yet been designed to a construction-drawing detail, Mitigation Measures 3.3.1 – 3.3.6 are needed to ensure the final drainage plans are designed to adequate prevent ponding of water and flooding. The proposed preliminary design of the drainage system, however, clearly demonstrates that a drainage system that prevents flooding is attainable. Therefore, with the incorporation of Mitigation Measures 3.3.1 – 3.3.6, the proposed project would not cause on- or off-site flooding.

Impact 3.6.6: Groundwater – Less than Significant Impact: The proposed project would increase the amount of impermeable surfaces onsite and, as a result, reduce the site's groundwater recharge potential. In addition, the proposed project would increase the use of groundwater as a water source and contribute to the existing overdraft of the groundwater basin.

The proposed project would lead to the conversion of approximately 220 acres of largely permeable agricultural land to largely impermeable developed land. Currently, the site contains approximately 24 acres of developed land including residences and a

Moose Lodge. The proposed project would increase the developed space onsite to up to approximately 220 acres. While the proposed onsite parks and detention basin site would be largely permeable, all the proposed land uses include impermeable surfaces, including parking lots, roadways, driveways, sidewalks, and building footprints. While not all 220 acres of developable land will become impermeable, the proposed project would increase the amount of impermeable surface onsite and, in turn, decrease the percolation potential of the project site.

The proposed detention basin would, however, collect the site's stormwater and allow such stormwater to partially percolate into the groundwater table. The proposed detention basin would have a maximum capacity of 48 acre-feet and is designed to empty (via both piped outflow and percolation) within three days. With the proposed detention basin, the project's increase of impermeable surfaces onsite would not significantly impact the percolation potential of the project site.

In addition to installing impermeable surfaces, the proposed development would utilize groundwater as a water source, thus, withdrawing water directly from the groundwater basin (see Section 3.11 of this EIR for a complete discussion of water supply). Average groundwater use for agricultural lands is 3.2 acre feet per acre, but much of the site has been converted to drip irrigation for vineyards or is fallow, so actual use is much less. The proposed development would increase water demand. Currently, the groundwater basin is in an overdraft situation. As outlined in the City's 2005 Urban Water Management Plan, the City draws groundwater in excess of 17,000 acre-feet (AF) per year, which has been determined to exceed the historical safe draw volume of 15,000 AF per year. To address this problem, the City's 2005 Urban Water Management Plan identifies the following five strategies that are being implemented to resolve this short coming:

1. Establishment of a Water Conversation Program—The City has already established a Water Conservation Ordinance and a Water Conservation Rebate program that has shown reductions in demand. Continued implementations of these programs will reduce the current overdraft condition and will eventually develop surplus capacity that could be used to meet the needs of the project.

2. Establishment of a Recycle Water System—The City has developed a water reuse program and is treating water for reuse at the Wastewater treatment plant. Currently, this water is being distributed to area farmers, thereby reducing their groundwater and surface water demands and improving the overall regional water balance. Expansion of this program is being planned and the incorporation of recycled water for landscape areas and other acceptable uses will further reduce demand on the groundwater basin.

3. Development of Groundwater Recharge systems—The City is looking into groundwater recharge systems. Such systems are not currently considered for the Reynolds Ranch project, although other developments around the City are including such systems to provide additional groundwater recharging, improving the city's water balance.

4. Development of Surface Water Treatment—The City has acquired an additional 6,000 AF of water rights from the Woodbridge Irrigation District. The City is considering developing a water treatment plant to provide additional supply for the City consumers. This surface water could also be used as groundwater recharge supply as an alternative as outlined above.

5. Development of Additional Water Wells—Wells provide an efficient means of providing for peak day and peak hour water demands by providing a distributed water source system. Adding additional wells do not necessarily increase ground water useage, especially if those wells are used primarily to meet peak day, peak hour or emergency water demands.

The City has accepted 15,000 AF as the demand that the groundwater basin can accept without experiencing significant draw down, based on the City's current land area. Based on the expansion of the City's acreage, the safe yield would increase by 430 acre feet.

Increase safe yield = project area * safe yield / current area of the City
=220 acres * 15,000 acre feet/ 7,680 acres
=429.68 acre feet

With annexation, the safe yield of the groundwater basin will increase to 15,430 acre feet. Even though the current City needs exceeds this amount, the basin has not yet demonstrated significant degradation and is still able to meet the City's needs in the short term. Regardless, the proposed project would contribute to this overdraft.

Phase I of the proposed project is anticipated to be developed before 2010, which is when the 6,000 AF of purchased water rights from WID is expected to be available for use. As such, prior to 2010 Phase I would rely on the groundwater basin for water supply. As described in the project's Water Supply Assessment (included in Appendix H of this EIR), Phase I of the proposed project is projected to use 137 AF of water per year, and the entire Reynolds Ranch Project is anticipated to require about 510 acre-feet (AF) of water annually.

Given that two of the City's programs to reduce demand (conservation and recycled water use) are already on line and are showing signs of success and that the other programs are being developed and expanded to reduce groundwater demands, it is reasonable to determine that the ground water supply capabilities of the basin will meet the needs of the City and of the project in the short term. Through metering, the City's Water Conservation Program alone could save 3,800 AF of water annually by the year 2030 (City of Lodi Urban Water Management Plan, 2005).

After 2010, the additional water rights purchased from WID alone will reduce the City's drawn on the groundwater basin to within the estimated safe yield. Even with the contribution of the project's ultimate annual demand of 510 AF, once the additional 6,000 AF of water rights is available, the City will clearly be able to meet the Citywide demand without needing to draw more than 15,000 AF per year from the groundwater basin. As such, the project's contribution to a groundwater basin overdraft situation is a

short term impact, that will be alleviated by the City's newly acquired water rights. Therefore, the increased demand on the groundwater basin caused by the project is a less-than-significant impact.

3.6.7. CUMULATIVE IMPACTS

Water Quality

The only water pollutants that could be released from the project site include runoff induced sediment, vehicle and equipment fluids, household chemicals, trash, landscaping byproducts, and other typical urban stormwater pollutants. The NPDES was established to regulate stormwater pollution. In accordance with NPDES, San Joaquin County and the City of Lodi has implemented a Stormwater Management Plan (SMP) for urban runoff.

The SMP is a regional plan designed to reduce the pollutant levels of receiving waters. Thus, the plan is intended to achieve a cumulative reduction in water pollutants. Compliance with this SMP ensures the project would not substantially contribute to cumulative water quality impacts.

Flooding and Drainage Systems

The proposed project would alter the site's drainage pattern and install an engineered drainage system to manage onsite stormwater flows. Therefore, the proposed project will not impact the City's currently constructed overall storm drain collection system, because the collection will be managed locally.

Groundwater

As discussed above in Impact 3.6.6, the proposed project would contribute an existing overdraft of the groundwater basin. As outlined in the City's 2005 Urban Water Management Plan, the City draws groundwater in excess of 17,000 acre-feet (AF) per year, which has been determined to exceed the historical safe draw volume of 15,000 AF per year. The proposed project would rely on groundwater as the sole water source for Phase I until the year 2010. After 2010, the City will be fully using the 6,000 AF of water per year would become available from water rights the City has purchased from WID. These additional water rights alone would reduce the City's dependence on the groundwater basin to an acceptable level.

As described in the project's Water Supply Assessment (included in Appendix H of this EIR), Phase I of the proposed project is projected to use 137 AF of water per year, and the entire Reynolds Ranch Project is anticipated to require about 510 acre-feet (AF) of water annually. This incremental increase to the City's overdraft of the groundwater basin is not cumulatively considerable. The City's 2005 Urban Water Management Plan outlines the City's approach to supplying water to its constituents through the year 2030. As shown in this Urban Water Management Plan, the City's water supply program will meet the demands of the City, including the demands of the proposed project and other

anticipated growth, while reducing the City's dependence on the groundwater basin to less than 15,000 AF per year (or 15,430 acre feet with the annexation).

3.6.8. MITIGATION MEASURES

Mitigation Measure 3.6.1: To the satisfaction of the City of Lodi Public Works Department, a detailed engineering analysis for the development of a stormwater collection system that will serve the project and potential future development between Reynolds Ranch and the Woodbridge Irrigation District (WID) canal shall be prepared. Said analysis shall include sizing of the pipe network and sizing of the detention basins and pump station discharging to the WID canal.

Mitigation Measure 3.6.2: To the satisfaction of the City of Lodi Public Works Department, the proposed pump station shall include provisions for managing the discharge flow rate to serve the needs of the City and to satisfy the terms of the discharge agreement.

Mitigation Measure 3.6.3: To the satisfaction of the City of Lodi Public Works Department, all drainage facilities shall be constructed in conformance with the standards and specifications of the City of Lodi.

Mitigation Measure 3.6.4: To the satisfaction of the City of Lodi Public Works Department, the detention basin shall include a low flow facility to enhance water quality and to help manage nuisance flows. Other water quality control features shall be incorporated into the project design to improve water quality of the storm discharge to the satisfaction of the City of Lodi Public Works Department.

Mitigation Measure 3.6.5: To the satisfaction of the City of Lodi Public Works Department, as part of the design process, a detailed drainage master plan shall be developed to identify collection and storage facilities, phasing and other appurtenances needed to insure that the system meets the requirements of the City drainage system.

Mitigation Measure 3.6.6: To the satisfaction of the City of Lodi Public Works Department, the project proponents shall participate in a financing mechanism to fund the required drainage infrastructure to serve the demands of the project. Funding of drainage infrastructure in accordance with Conditions of Approval for the project shall satisfy this mitigation measure.

3.6.9. LEVEL OF SIGNIFICANCE AFTER MITIGATION

The project would not significantly impact hydrology or water quality. The following table is a summary of the thresholds of significance, potential impacts, and associated mitigation measures.

TABLE 3.6-2: SUMMARY OF HYDROLOGY AND WATER QUALITY THRESHOLDS OF SIGNIFICANCE, IMPACTS, AND MITIGATION MEASURES

Threshold of Significance	Recommended Mitigation Measure	Level of Significance
Would the project 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?	None required.	No Impact
Would the project place within a 100-year flood hazard area structures, which would impede or redirect flood flows?	None required.	No Impact
Would the project be inundated by seiche, tsunami, or mudflow?	None required.	No Impact
Would the project 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.	None required. Potential project impacts would be lessened by the existing Emergency Action Plan that would be initiated by the East Bay Municipal Utility District. See the discussion of Impact 3.6.1 on pages 3.6-11 through 3.6-12.	Less than Significant Impact
Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provides substantial additional sources of polluted runoff?	Mitigation Measure 3.6.1: To the satisfaction of the City of Lodi Public Works Department, a detailed engineering analysis for the development of a stormwater collection system that will serve the project and potential future development between Reynolds Ranch and the Woodbridge Irrigation District (WID) canal shall be prepared. Said analysis shall include sizing of the pipe network and sizing of the detention basins and pump station discharging to the WID canal. Mitigation Measure 3.6.2: To the satisfaction of the City of Lodi Public Works Department, the proposed pump station shall include provisions for managing the discharge flow rate to serve the needs of the City and to satisfy the terms of the discharge agreement. Mitigation Measure 3.6.3: To the satisfaction of the City of Lodi Public Works Department, all drainage facilities shall be constructed in conformance with the standards and specifications of the City of Lodi. Mitigation Measure 3.6.4: To the satisfaction of the City of Lodi Public Works Department, the detention basin shall include a low flow facility to enhance water quality and to help manage nuisance flows. Other water quality	Less than Significant Impact After Mitigation

TABLE 3.6-2: SUMMARY OF HYDROLOGY AND WATER QUALITY THRESHOLDS OF SIGNIFICANCE, IMPACTS, AND MITIGATION MEASURES

Threshold of Significance	Recommended Mitigation Measure	Level of Significance
	control features shall be incorporated into the project design to improve water quality of the storm discharge to the satisfaction of the City of Lodi Public Works Department. Mitigation Measure 3.6.5: To the satisfaction of the City of Lodi Public Works Department, as part of the design process, a detailed drainage master plan shall be developed to identify collection and storage facilities, phasing and other appurtenances needed to insure that the system meets the requirements of the City drainage system. Mitigation Measure 3.6.6: To the satisfaction of the City of Lodi Public Works Department, the project proponents shall participate in a financing mechanism to fund the required drainage infrastructure to serve the demands of the project. Funding of drainage infrastructure in accordance with Conditions of Approval for the project shall satisfy this mitigation measure. Potential project impacts would be lessened through the project's Infrastructure Master Plan. See the discussion of Impact 3.6.2 on page 3.6-13.	
Would the project violate any water quality standards or waste discharge requirements?	None required. Potential project impacts would be lessened through the required compliance with the National Pollutant Discharge Elimination System. See the discussion of Impact 3.6.3 on pages 3.2-13 through 3.2-14.	Less than Significant Impact
Would the project 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?	None required. Potential project impacts would be lessened through the project's Infrastructure Master Plan. See the discussion of Impact 3.6.4 on pages 3.2-14 through 3.2-15.	Less than Significant Impact
Would the project substantially alter the 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?	Mitigation Measures 3.6.1 – 3.6.6 Potential project impacts would be lessened through the project's Infrastructure Master Plan. See the discussion of Impact 3.6.5 on page 3.6-15.	Less than Significant Impact After Mitigation
Would the project otherwise substantially degrade water quality?	Potential project impacts would be lessened through the project's Infrastructure Master Plan. See the discussion of Impact 3.6.2 on page 3.6-13.	Less than Significant Impact

TABLE 3.6-2: SUMMARY OF HYDROLOGY AND WATER QUALITY THRESHOLDS OF SIGNIFICANCE, IMPACTS, AND MITIGATION MEASURES

Threshold of Significance	Recommended Mitigation Measure	Level of Significance
Would the project 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?	Potential project impacts would be lessened through project design features and the City's water supply strategy. See the discussion of Impact 3.6.6 on pages 3.6-15 through 3.6-17.	Less than Significant Impact