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## 3.4 - Hydrology and Water Quality

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### 3.4.1 - Summary

This section describes the existing hydrology and water quality conditions and potential effects from project implementation on the site and its surrounding area. Implementation of the proposed project would not result in significant unavoidable impacts to hydrology and water quality.

### 3.4.2 - Environmental Setting

#### Regional Hydrology

The proposed incorporation area is located in the Sacramento River hydrologic region, specifically in the Lower American River (LAR) hydrologic subarea of the (DWR 2005). The Sacramento River serves as the central spine of the Sacramento River hydrologic region, draining the area from Modoc County in Northern California, the west side of the Sacramento Valley, the west slope of the Sierra Nevada Mountains, to the Delta. The region covers 27,246 square miles and all or portions of 20 Northern California counties (DWR 2005). The LAR subarea drains the northeastern portion of Sacramento County, a small portion of El Dorado County south of Folsom Lake, and part of southern Placer County. Major rivers in the immediate region include the American and Sacramento rivers. The American River drains into the Sacramento River in the City of Sacramento. Both the Sacramento and American rivers have extensive levee systems in place.

The American River Watershed encompasses about 2,100 square miles and has an average annual discharge of approximately 2.6 million acre-feet per year (SCGP 1993). The American River is located south of the proposed incorporation area and directly abuts a small portion of the proposed incorporation area's southwestern edge (see Exhibit 3.4-1). The distance from the Arden Arcade boundary to the American River varies from approximately 0.5 mile at Watt Avenue and 1 mile at Howe Avenue to immediately adjacent at the southwestern corner of the proposed incorporation boundary. The American River is bounded on both banks by levees. The levees are located west of Arden Way on the north bank and west of Mayhew Road on the south bank, continuing to the confluence of the American and Sacramento rivers (approximately 5 miles west of the Arden Arcade boundary). Maintenance and improvements of the levees are further discussed below in the Flooding and Flood Control and Regulatory Setting sections.

There is one lake in the LAR subarea. Lake Natoma, behind Nimbus Dam, is approximately 16 miles east of the confluence of the Sacramento and American rivers. Folsom Lake is located approximately 2 miles east of Lake Natoma behind Folsom Dam in the adjacent Foothill Drain hydrologic area. Located within the LAR subarea are several streams and sloughs, including Arcade Creek, Alder Creek, Chicken Ranch Slough, Cripple Creek, and Strong Ranch Slough.

#### Localized Drainage

The proposed incorporation area is located in the western portion of the LAR hydrologic subarea. The Arden Arcade area generally drains from the northeast to the southwest, towards the American

River. The two major waterways within the proposed incorporation area are Chicken Ranch Slough and Strong Ranch Slough and their associated unnamed tributaries. Both Chicken Ranch Slough and Strong Ranch Slough originate east of the Arden Arcade proposed incorporation boundary and collectively drain approximately 15 square miles within Sacramento County, including the majority of the proposed incorporation area (DFCE 2006). Within the proposed incorporation area, Chicken Ranch Slough and Strong Ranch Slough have been extensively altered (i.e., straightened and/or concrete lined) for a least a portion of their courses to accommodate historical development.

Chicken Ranch Slough traverses the northern portion of the Arden Arcade area, flowing from east to west. The Chicken Ranch Slough turns south as it approaches the western edge of the Arden Arcade proposed incorporation boundary, ending in the southwestern corner of the area. South of Chicken Ranch Slough is Strong Ranch Slough, which similarly flows from east to west. Strong Ranch Slough joins the Chicken Ranch Slough near the western boundary of the Arden Arcade area, draining into the County of Sacramento detention basin D-05 (Exhibit 3.4-2).

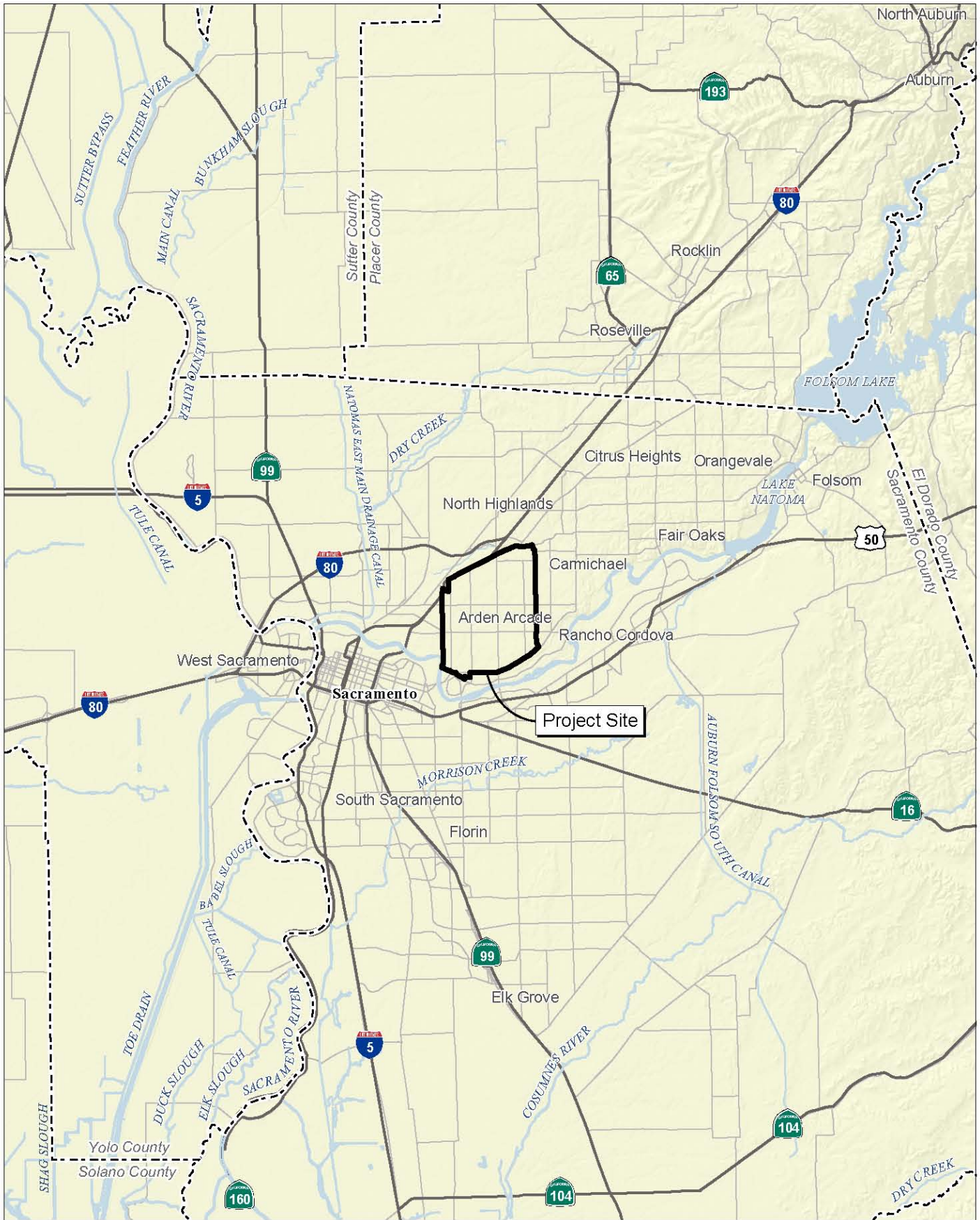
The D-05 detention basin moves water from the Chicken Ranch Slough/Strong Ranch Slough to the American River. The detention basin is located immediately adjacent to the levee on the American River south of the Cal Expo Racetrack and is partially inside the Arden Arcade proposed incorporation boundary. A system of culverts, gates, and pumps regulates the water flow between the American River and the D-05 detention basin. Depending on the height of water in the American River, water from D-05 flows into the river by gravity (when the river is low), or by the pumping station (when the river is higher than water levels in D-05). Therefore, the water level in the western portion of Chicken Ranch Slough/Strong Ranch Slough area is affected by the amount of water in the D-05 detention pond and in the American River. If the water level in D-05 is high and is unable to drain into the American River, water may back up in the Chicken Ranch Slough/Strong Ranch Slough and cause flooding (DFCE 2006).

Several existing hydrologic studies have been prepared for the Chicken Ranch Slough/Strong Ranch Slough area. Summaries of the studies are available in the Strong and Chicken Ranch Slough Watershed Alternative Analysis, Table 1 (DFCE 2006).

## **Surface Water Resources and Quality**

### ***Surface Water Quality***

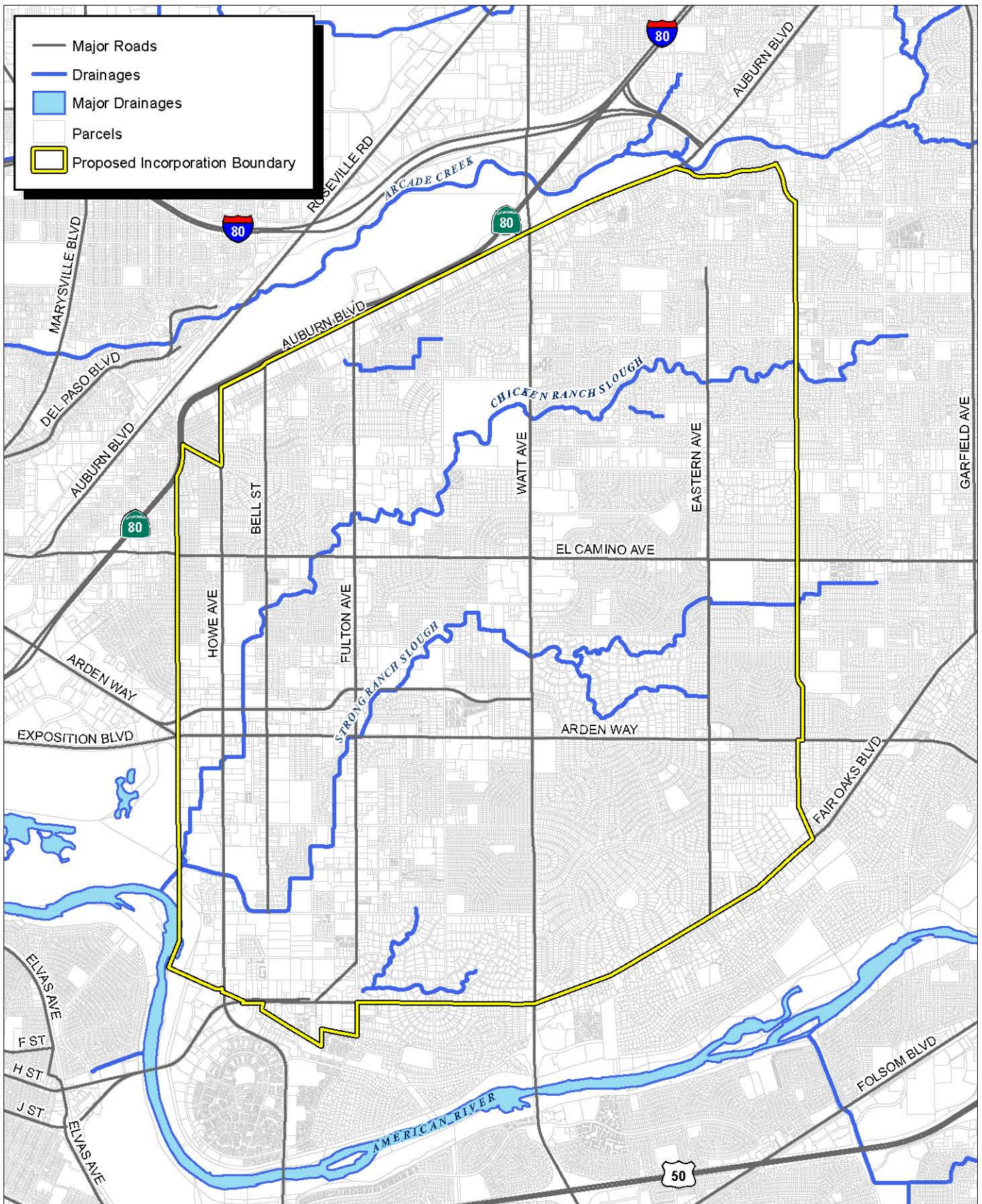
The Arden Arcade proposed incorporation area is urban, primarily developed with residential and commercial land uses as described in Section 3.5, Land Use and Planning. Both non-storm (nuisance) and stormwater discharge influence surface water quality. Nuisance runoff includes surface drainage from residential and commercial land uses, including landscape irrigation; surface cleaning; and other similar activities. In addition, stormwater discharged to the sloughs conveys runoff from areas of saturation or impervious surfaces. Stormwater flow in an urban area often includes contaminants collected from developed surfaces.



Source: Census 2000 Data, The CaSIL, Sacramento County GIS 2009 & MBA GIS 2009.



## Exhibit 3.4-1 Regional Hydrology



Source: Sacramento County GIS (2009), SACOG (2009), MBA (2009).



Chicken Ranch Slough and Strong Ranch Slough are listed as impaired waterways on the California State Water Resources Control Board's 303(d) list; Chicken Ranch Slough is known to contain chlorpyrifos, and Strong Ranch Slough is known to contain chlorpyrifos and diazinon.

### ***Non-Point Pollution Sources***

Non-point pollution sources are the major contributing factors to surface water pollution in the proposed incorporation area. Non-point sources range from parking lots to bare earth at construction sites to landscape sites and a host of other sources. Pollutants and soil particles are washed into surface water bodies such as storm drains, sloughs, drainage basins, or detention ponds. The total amount of pollutants entering surface waters from these nonpoint sources is generally considered to be greater than that from any other source (such as pipe discharges, i.e. point source) in urban areas, such as the proposed incorporation area.

### ***Urban Nuisance Runoff***

Generally, urban nuisance runoff is the largest contributor of non-point-source, surface water pollution. Nuisance runoff is often found to contain contaminants contributing to surface water quality degradation and possible toxicity to aquatic organisms. Nuisance runoff typically originates from sources such as landscape over-irrigation and property management or maintenance activities. Because the Arden Arcade proposed incorporation area is served by an in-street storm drain collection system that discharges to the surrounding sloughs, nuisance runoff either flows into the sloughs before entering the American River or percolates into local groundwater.

Contaminants typically found in urban nuisance runoff include substances such as nitrates and phosphates from fertilizer, water-soluble pesticides used for garden pest control, and surfactants from detergents (car washing). In addition, storm drains have been notorious repositories of illegally dumped hazardous materials, including used motor oil, fuels, solvents, and other liquid wastes. During the summer dry season, when in-stream slough flows are at their lowest, impacts from contaminants is increased due to increased concentrations.

### ***Stormwater Runoff***

Stormwater runoff also influences surface water quality. Similar to nuisance runoff, stormwater runoff has been documented to contain contaminants contributing to surface water quality degradation and toxicity to aquatic organisms. Stormwater runoff, prior to entering a stormwater collection system, picks up small particulates, large detritus, and both soluble and insoluble chemicals. A primary pollutant contributor to stormwater is runoff from roadways and parking lots. Stormwater from paved surfaces and associated medians often contains pollutants such as copper from brake pads, lead and cadmium from batteries, oil, grease, fuel constituents, pesticides, fertilizers, and solid waste/detritus.

## Groundwater Resources and Quality

The Arden Arcade area overlies the South American Sub-basin aquifer, which is located within the Sacramento Valley Groundwater Basin. The proposed incorporation area's hydrologic system has been described in the County of Sacramento's Integrated Groundwater and Surface Water Model (IGSM) and the 1993 General Plan and Background Report. The groundwater resources are contained in a two-aquifer system—an unconfined upper (shallow) aquifer and a semi-confined lower (deep) aquifer (SCGP 1993). The two aquifers are separated by a semi-confining barrier (aquiclude) approximately 50 feet thick. Regionally, water has been overdrafted in parts of the County of Sacramento since the 1940s. Three main areas of substantial groundwater overdraft are identified in Sacramento County, one of which extends into the northern portion of the Arden Arcade proposed incorporation area. Land subsidence can occur in areas where groundwater overdraft is present as a result of structural changes to soils from dewatering. Although the groundwater of Sacramento County and, in particular, an area bordering the northern proposed incorporation boundary have been historically overdrafted, there has been no reported land subsidence associated with groundwater withdrawal in the proposed incorporation area, or in any other geologically similar areas in California.

The State Water Resources Control Board has identified beneficial uses of the Sacramento Valley Groundwater Basin, which include municipal use.

Groundwater is recharged by regional precipitation, regional subsurface flow, and infiltration from surface waters. Direct recharge from regional precipitation is limited by the soils in the proposed incorporation area, which are documented as having poor groundwater recharge capabilities (SCGP 1993). In addition, the proposed incorporation area is primarily urban, with extensive coverage of impervious surfaces such as roads, parking lots, and buildings, further limiting the potential for groundwater recharge from local precipitation. Groundwater in the proposed incorporation area is thus replenished mainly from regional upgradient subsurface flow with minor amounts from surface water infiltration within the proposed incorporation area.

Groundwater accounted for approximately 60 percent of the total water used by the County of Sacramento in 1987 (SCGP 1993). In 2008, groundwater accounted for roughly 53 percent of the water supply for Sacramento County north of the American River. Table 3.4-1 shows the water supply mix for the five water purveyors serving the proposed incorporation area; these figures are not exclusive to the proposed incorporation area, as some of the purveyors also serve other areas in Sacramento County north of the American River but outside the boundaries of the proposed incorporation area (SGA 2008). There is minimal agricultural land within the Arden Arcade proposed incorporation area, as described in Section 3.5 - Land Use and Planning. Therefore, agricultural uses do not substantially contribute to the groundwater use in the proposed incorporation area.

**Table 3.4-1: Water Purveyors Serving the Proposed Incorporation Area Supply Mix 2005–2007  
(in acre-feet)**

Year	2005		2006		2007	
District/Supply	Groundwater	Surface Water	Groundwater	Surface Water	Groundwater	Surface Water
Del Paso Manor Water District	1,657	0	1,654	0	1,638	0
<b>Total</b>	<b>1,657</b>		<b>1,654</b>		<b>1,638</b>	
Golden States Water Company	1,248	0	1,296	0	1,252	0
<b>Total</b>	<b>1,248</b>		<b>1,296</b>		<b>1,252</b>	
Cal American Water Company	17,978	0	17,963	1,024	17,669	384
<b>Total</b>	<b>17,978</b>		<b>18,987</b>		<b>18,053</b>	
Sacramento Suburban Water District	26,830	14,364	26,559	13,345	37,932	7,544
<b>Total</b>	<b>41,194</b>		<b>39,904</b>		<b>45,476</b>	
Sacramento County Water Agency	5,111	0	5,133	0	5,353	0
<b>Total</b>	<b>5,111</b>		<b>5,133</b>		<b>5,353</b>	
Source: Sacramento Groundwater Authority, Groundwater Management Plan, 2008						

Generally, groundwater quality is affected by both naturally occurring and human-made constituents. Potential sources of groundwater contamination are identified in Section 3.3 – Hazards. The largest sources of groundwater pollution near the proposed incorporation area are residual contaminants from the McClellan Air Force Base operations.

**Contamination Plumes**

The former McClellan Air Force Base (McClellan AFB), located approximately 1 mile north of the Arden Arcade proposed incorporation boundary, presents particular concern for groundwater quality. McClellan AFB is a Superfund site ranked as one of America’s worst polluted Air Force bases. It is estimated that over 12 billion gallons of groundwater beneath the base are severely contaminated as a result of historical base activities. Cleanup of the soils and groundwater are ongoing and are expected to take approximately 40 years and to cost \$900 million (SCGP 2006).

**Flooding and Flood Control**

Flooding is defined as an overflowing of normally dry land, often after heavy rain. When the capacities of streams and storm drainage facilities are exceeded, flooding often occurs. The Sacramento area has historically been challenged with flooding. Before the 1900s, flooding due to winter storms occurred regularly in the Sacramento Valley. In addition, mining activity increased the

severity of flooding, which was due to decreased soil water capacity, channel sedimentation, and construction of levees derived from excess mine tailings. Tight soils in the proposed incorporation area as well as extensive impervious surfaces such as pavements and roof surfaces contribute to high rates of runoff during storm events.

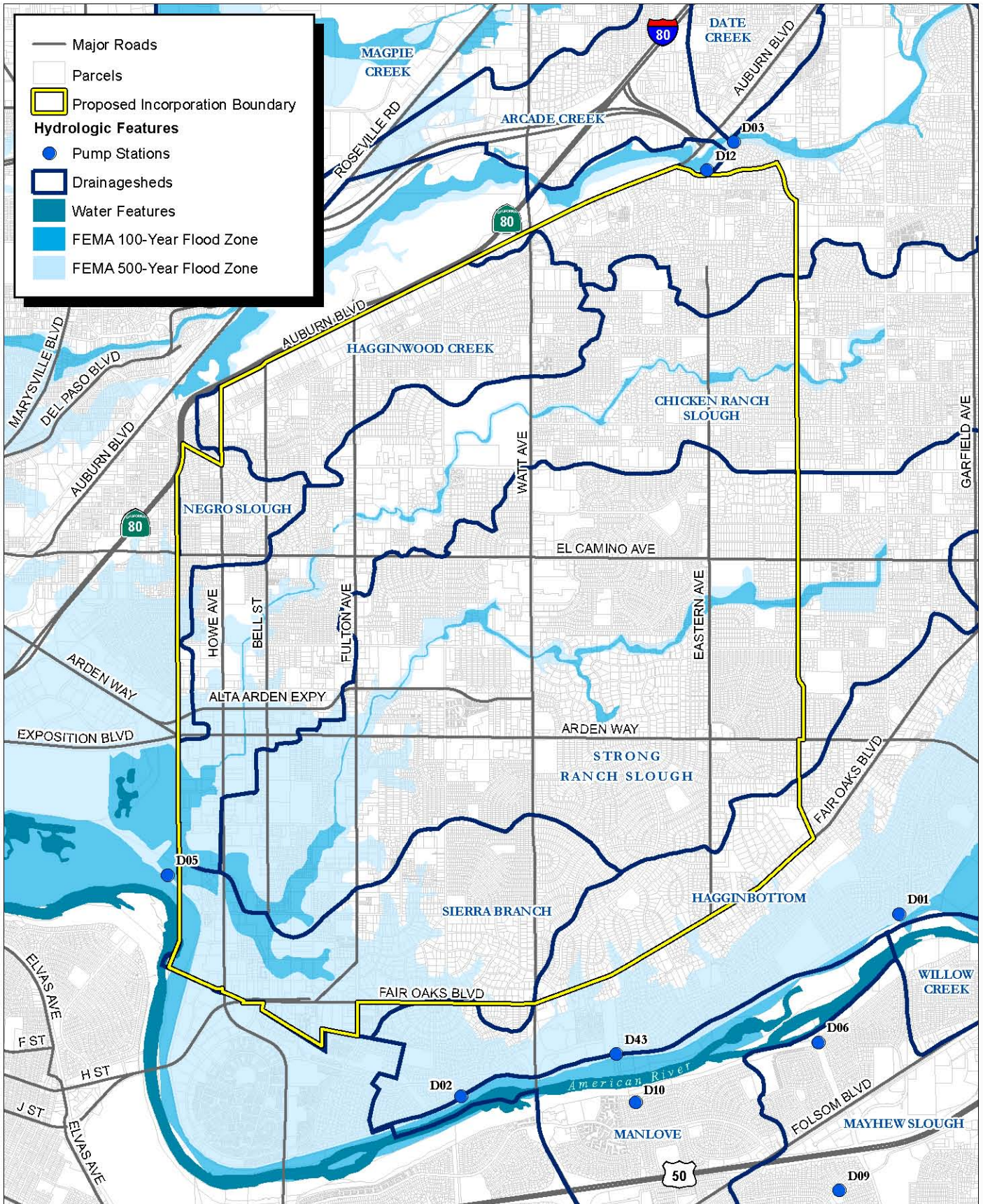
Today, the American River has an extensive systems of dams, levees, pumping stations, overflow weirs, and other flood control structures. Development of the flood control system has greatly diminished the extent of flood hazard areas. However, areas are still subject to flooding from overflow of Chicken Ranch Slough/Strong Ranch Slough and drainage canals during large storm events.

The majority of the Arden Arcade proposed incorporation area designated by Federal Emergency Management Agency (FEMA) as Flood Zone X, which is outside of the expected 100-year flood plain. However, portions along Chicken Ranch Slough and Strong Ranch Slough are designated as Flood Zone AE, a high-risk zone that has a chance of inundation by a 100-year flood. Areas surrounding the Chicken Ranch Slough contain 0.250 square mile of land in the Flood Zone AE. Similarly, Strong Ranch Slough areas contain 0.442 square mile in AE (SCPW 2001). Localized flooding has occurred along Strong Ranch Slough as recently as 2005. The extent of Flood Zone AE around Chicken Ranch Slough/Strong Ranch Slough in addition to the larger 500-year flood zone is illustrated in Exhibit 3.4-3.

As discussed in Localized Drainage, detention basin D-05 drains the Chicken Ranch Slough/Strong Ranch Slough's into the American River. The D-05 basin is a 100 acre-foot pond with six electrical pumps capable of pumping of approximately 1,000 cubic feet per second (cfs). An additional 50 cfs pump can be operated during restricted conditions, but not when the other six pumps are operating. The water level in the western portion of the Chicken Ranch Slough/Strong Ranch Slough area is affected by the amount of water in the D-05 detention pond and in the American River. As previously stated, if the water level in D-05 is high and is unable to drain into the American River, water may back up in the sloughs and cause flooding. In addition, flooding may occur if the flow volume in the sloughs exceeds the sloughs' capacity and/or the inflow into D-05 exceeds the outflow capacity (DFCE 2006).

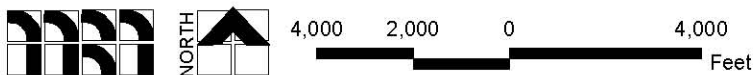
In addition to potential flooding from Chicken Ranch Slough/Strong Ranch Slough, portions of the Arden Arcade proposed incorporation area would be affected by flooding if the American River levee failed. The County of Sacramento and the City of Sacramento have developed hypothetical levee break scenarios and have estimated the time it would take to flood and the depth of flooding. The first levee break scenario shows a failure of the north-bank levee approximately 1.25 miles east of Watt Avenue. The second scenario calculates a failure of the north-bank levee approximately 0.25 miles east of Watt Avenue. In both scenarios, flooding was estimated to occur in the southwestern corner of the Arden Arcade proposed incorporation area.





Source: Sacramento County GIS (2009), SACOG (2009), FEMA, MBA (2009).

### Exhibit 3.4-3 FEMA Designated Flood Hazard Zones



Michael Brandman Associates

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Flooding is estimated to be more extensive in area and depth in the second scenario. Areas of flooding would center around the Cal Expo racetrack and near Campus Commons, with low levels of flooding extending up Strong Ranch Slough and low-lying land near Fair Oaks Boulevard and the Cal Expo Fairgrounds (SCMSA 2007).

Nimbus Lake and Folsom Lake are located on the American River upstream of the Arden Arcade proposed incorporation area. Dam failure on either lake could cause flooding in the proposed incorporation area. Both the County of Sacramento and the City of Sacramento have prepared flood inundation maps. Folsom Dam failure inundation maps should soon be available for the City of Sacramento's General Plan Update Technical Background Report. The County of Sacramento's Background Report to the 1993 General Plan and 2006 General Plan Update, Safety Element contains a generalized Folsom Dam failure flood area map. If Folsom Dam had a catastrophic failure, the southern and western areas of the proposed incorporation area may be flooded (SCGP 2006).

The following discussion of flood control systems and flood control policies is summarized from the Sacramento County 1993 General Plan Safety Element, Section III, Flooding Technical Discussion, and other sources as noted.

### ***American River Flood Control System***

The American River Flood Control System that provides flood protection to the proposed incorporation area consists of Folsom Dam, Nimbus Dam, an auxiliary dam at Mormon Island, and eight earth-filled dikes. The American River flood control system was designed to hold a maximum flow of 115,000 cfs with a designed minimum of 5 feet of freeboard (SGPU, 2005). The California State Reclamation Board, with the assistance of the USACE, prepared the American River Watershed Investigation, which evaluated various alternatives to achieve flood protection along the American River.

In 1999, the United States Congress approved projects to improve the American River flood protection, including enlarging outlets at Folsom Dam and raising the lowest levees on the American River. Improvements were installed on the American River levees in 2005, including deep under-seepage cutoff walls and erosion protection and operational improvements for Folsom Dam to provide 100-year protection for much of the American River Floodplain (SAFCA 2007). The United States Congress recently passed the Water Resources Development Act of 2007, which appropriates initial funding for upgrades consisting of enlarging the eight existing river outlets, constructing two additional river outlets, and modifying the use of surcharge storage at Folsom Dam.

### **3.4.3 - Regulatory Setting**

Water use, quality, and flood control are regulated by multiple agencies at the national, state, and local level; each agency involved has different degrees of control. At the federal level, regulating agencies include the U.S. Environmental Protection Agency (EPA), the U.S. Bureau of Reclamation, the USACE, and FEMA. The California State Water Resources Control Board (SWRCB), the State

Reclamation Board, and the Department of Water Resources (DWR) regulate at the state level. The County of Sacramento and the Sacramento Area Flood Control Agency (SAFCA) are involved at the local level. Applicable state plans, local regulations, and local plans are provided in Table 3.4-2 below.

**Table 3.4-2: Applicable Plans, Ordinances, and Standards**

Plan Title	Prepared by	Year of Adoption
Floodplain Management Ordinance	County of Sacramento	1993
Sacramento County General Plan	County of Sacramento	1993
Water Quality Control Plan (Basin Plan) for the Sacramento River and San Joaquin River Basins	California Regional Water Quality Control Board, Central Valley Region	1998
2001 Local Floodplain Management Plan for Sacramento County	County of Sacramento Public Works Agency, Department of Water Resources	2001
Lower American River Corridor Management Plan (RCMP)	The Lower American River Task Force	2002
California's Groundwater, Update 2003 (DWR Bulletin 118)	California Department of Water Resources	2003
California Water Plan Update 2005, Volume 3 (12 Regional Reports), Chapter 6 Sacramento River Hydrologic Region (DWR Bulletin 160-05)	California Department of Water Resources	2005
Sacramento County Improvement Standards Section 11: Erosion and Sediment Control	County of Sacramento	2006
Stormwater Quality Design Manual for the Sacramento and South Placer Regions	Sacramento Stormwater Quality Partnership	2007

## Federal and State

### ***National Flood Insurance Program***

FEMA is responsible for determining new flood elevations for Sacramento County based on USACE studies. FEMA is also responsible for distributing the Federal Insurance Rate Map (FIRM) that is used in the National Flood Insurance Program (NFIP).

### ***Clean Water Act***

The major federal legislation governing the water quality aspects of the proposed incorporation area is the provisions of Section 303 of the Clean Water Act (CWA) as amended by the Water Quality Act of 1987. The objective of the CWA is to “restore and maintain the chemical, physical, and biological integrity of the Nation’s waters.”

Section 303(d) of the federal Clean Water Act requires states to identify water bodies that do not meet water quality standards and are not supporting their beneficial uses. In addition to identifying the water bodies that are not supporting beneficial uses, the Section 303(d) list also identifies the

pollutant or stressor causing impairment, and establishes a schedule for developing a control plan to address the impairment. Both the Chicken Ranch Slough and the Strong Ranch Slough have been identified as not meeting water quality standards set forth in the CWA (see section on surface water quality). In addition, the American River has been identified on the Section 303(d) list as impaired by mercury from abandoned mines (SWRCB, 2006).

### ***Porter-Cologne Water Quality Control Act***

The State of California's Porter-Cologne Water Quality Control Act (Division 7 of the California Water Code) provides the basis for water quality regulations within California. The SWRCB administers water rights, water pollution control, and water quality functions throughout the State, while the Regional Water Quality Control Boards conduct planning, permitting, and enforcement activities. The proposed incorporation area is located within the jurisdiction of the Central Valley Regional Water Quality Control Board (RWQCB).

The Porter-Cologne Act requires that each RWQCB develop a water quality control plan for areas within its jurisdiction. In the 1998 Sacramento River Basin Plan, the SWRCB identified beneficial uses for the American River, which include municipal and domestic uses, irrigation, industry service, power supply, recreation, warm and cold freshwater habitat, migration, spawning, and wildlife habitat. Water quality objectives listed for groundwater include thresholds for bacteria, organic and inorganic chemical constituents, radioactivity, and taste and odor.

Levees maintained by the American River Flood Control District protect the Arden Arcade proposed incorporation area from high water during flood events. The State Reclamation Board has jurisdiction over flood control projects, which includes the American River levees.

### ***Construction Site Runoff Management***

The SWRCB has adopted a National Pollutant Discharge Elimination System (NPDES) for stormwater discharges associated with construction activity (General Permit). The Central Valley RWQCB administers the NPDES stormwater permitting program in the proposed incorporation area. Construction activities of 1 acre or more are subject to the permitting requirements of the NPDES General Permit and are required to submit a Notice of Intent (NOI) to the Central Valley RWQCB prior to the beginning of construction. The General Permit requires preparation and implementation of a Storm Water Pollution Prevention Plan (SWPPP) prior to the start of construction. Implementation of the SWPPP begins with the start of construction. Upon completion of construction, the project's applicant must submit a Notice of Termination to the Central Valley RWQCB to indicate that construction is completed. Note that no construction is proposed as a part of the proposed incorporation.

### ***Municipal Stormwater***

The federal CWA requires NPDES permits for municipal separate storm and sewer (MS4). The purpose of the NPDES program is to establish a comprehensive program to manage areawide urban

stormwater and reduce pollution of surface waters to the maximum extent possible. Sacramento County submitted and received an MS4 permit under Phase I of the MS4 implementation (Order No. R5-2002-0206) for all unincorporated areas of the County. The MS4 Permit requires the County to develop programs to control pollutants in urban stormwater runoff and evaluate the impacts of such discharges on local receiving waters. The cities of Sacramento, Rancho Cordova, Citrus Heights, Folsom, Galt, and Elk Grove are identified as co-permittees.

### **Local Regulations and Agencies**

Multiple local agencies have purview over surface and groundwater use, and flood control—often with overlapping authority. As a result, many of the agencies operate under similar joint or collaborative agreements.

#### ***Sacramento County Department of Water Resources and County Water Agency***

The Sacramento County Water Agency (SCWA) was created in 1952 and is a separate legal entity from the County of Sacramento but is operated by the Sacramento County's Municipal Services Agency, Water Resources Division (SCMSA 2007b and SCGP 2006). The Water Resources Division manages surface water and groundwater resources via the powers of the County of Sacramento and the Sacramento County Water Agency. The Water Resources Division also provides drainage, flood control, and water supply services to various areas in the unincorporated Sacramento County. The SCWA is empowered to levy fees. The Arden Arcade proposed incorporation area is located in Zone 13 and Zone 11B of the SCWA. Fees assessed on property in Zone 13 and Zone 11B fund studies related to water supply, drainage, and flood control within the zone (SCMSA 2007b).

In addition, a portion of the proposed incorporation area is served by SCWA Zone 41 (an improvement zone similar to Zone 11B and Zone 13 with water service responsibilities). Revenues collected from Zone 41 fund capital improvements (SCMSA 2007b).

#### ***Sacramento Area Flood Control Agency***

The Sacramento Area Flood Control Agency (SAFCA) was created in March 1989 to oversee local efforts in flood policy and protection. SAFCA was created through a Joint Exercise of Powers Agreement with the City of Sacramento, the counties of Sacramento and Sutter, the American River Flood Control District, and Reclamation District 1000. SAFCA's mission is to provide the region with at least a 100-year level of flood protection as quickly as possible while seeking a 200-year or greater level of protection over time (SAFCA 2007). The American River Flood Control District provides flood protection for the proposed incorporation area by maintaining the levees on the American River (ARFCD 2007).

#### ***Stormwater Quality Manual***

On May 18, 2007, the Stormwater Quality Design Manual for Sacramento and South Placer Regions (Manual) was adopted by the Sacramento Stormwater Quality Partnership, a collaborative of public agencies in Sacramento County that includes the County of Sacramento. This document replaces

previous documents, including the January 2000 Guidance Manual and the SATO sizing method originally included in the Volume II City/County Drainage Manual. The Manual is intended to satisfy the regulatory requirements of the partnership's respective municipal stormwater permits. The Manual outlines planning tools and requirements to reduce urban runoff pollution to the maximum extent practicable from new development and redevelopment projects (SSQP 2007).

### **Sacramento County Code**

The following Sacramento County General Plan Safety and Conservation Element policies and implementation measures govern future development within the proposed incorporation area.

#### *Safety Element – Flooding*

- **GOAL:** Minimize the loss of life, injury, and property damage due to flood hazards.
- **Policy SA-5.** A comprehensive drainage plan shall be prepared for urbanizing streams and their tributaries prior to any development within the 100-year floodplain defined by full watershed development without channel modifications. The plan shall:
  - a. Determine the future 100-year flood elevations associated with planned and full development of the watershed;
  - b. Determine the future 100-year floodplain boundaries for both flood elevations (planned and full development) based on minimum 2-foot contour intervals;
  - c. Assess the feasibility of gravity drainage into the existing flowline of the stream;
  - d. Assess the feasibility of alternative means of drainage into the stream;
  - e. Identify potential locations for sedimentation ponds and other stormwater treatment facilities;
  - f. Determine the minimum lowering of the stream bottom necessary and develop a channel design consistent with General Plan policies;
  - g. Determine the location and extent of marsh, vernal pool and riparian habitat; and
  - h. Develop measures for protecting and mitigating natural habitat.
  - i. Develop measures to ensure vector abatement control.

This policy is not applicable to downstream portions of urbanizing creeks identified as infill areas in Public Works Department policies for which the County does not intend to prepare master drainage plans.

- **Policy SA-8.** Fill within the 100-year floodplain of rural creeks outside of the Urban Service Boundary is permissible only to accommodate structures (e.g., residential, commercial, accessory) and septic systems, and only when the Board of Supervisors finds that the fill will not impede water flows or storm runoff capacity. Such development shall not cause an increase in base flood elevation of the 100-year floodplain exceeding one foot, unless analysis clearly indicated that the physical and/or economic use of adjacent property within the floodplain will not be adversely affected.

- **Policy SA-12.** The County shall require all new urban development projects to incorporate runoff control measures to minimize peak flows of runoff and/or assist in financing or otherwise implementing Comprehensive Drainage Plans.
- **Policy SA-15.** Deny creation of parcels that do not have buildable areas outside the 100-year floodplain. The buildable area may be constructed by the placement of fill as long as it conforms with other adopted floodplain policies.
- **Policy SA-16.** For residential zoning, the area outside the 100-year floodplain must be contiguous or reasonably situated to provide buildable area for a residence and associated structures. County of Sacramento General Plan 5 Safety Element (Adopted) Examples of structures include swimming pools, sheds, barns, detached garages, and other outbuildings that are normally associated with residential development.
- **Policy SA-17.** Vehicular access to the buildable area of newly created parcels must be at or above the 10-year flood elevation. Exceptions may be made when the existing public street from which access is obtained is below the 10-year flood elevation.
- **Policy SA-21.** Areas within a 100-year floodplain shall not be upzoned to a more intensive use unless and until a Master Drainage Plan is prepared that identifies areas of the floodplain that may be developed.

#### *Conservation Element – Water Quality*

- **Policy CO-9.** Community and specific plans shall specify urban runoff control strategies and requirements, consistent with Master Drainage Plans and Public Work's urban runoff management program, for development in newly urbanizing areas and identify sites where retention and treatment are warranted consistent with discharge permit requirement and county-wide runoff measures.
- **Policy CO-10.** Development within newly urbanizing areas shall incorporate runoff control measures in their design or participate in an areawide runoff control management effort consistent with the urban runoff management program developed by the Public Work's Department.
- **Policy CO-11.** Hazardous materials shall not be stored in the 100-year floodplain in such a manner as to pose a significant potential for surface water contamination.
- **Policy CO-12.** The concentration and management of large animals on residential and agricultural parcels shall be such that pasture runoff does not contain excessive nutrient concentrations which would contribute to surface water quality degradation.
- **Policy CO-13.** Roads and structures shall be designed, built and landscaped so as to minimize erosion during and after construction.
- **Policy CO-14.** Roads and structures shall be designed to minimize grading on slopes above 20 percent.

### 3.4.4 - Project Impact Analysis

#### Methodology for Analysis

The immediate action to allow proposed incorporation by LAFCo would not directly affect hydrology and water quality in the proposed incorporation area. All County of Sacramento ordinances will remain in effect for 120 days following the proposed incorporation. After that time, the new city may affirm the existing ordinances or adopt new ordinances.

Future land decisions made by the new City Council may result in land use decisions that impact the quality and quantity of water above those identified in the current Sacramento County General Plan EIR. Because the majority of the proposed incorporation is currently developed, the extent of potential changes to land use examined in this document is logically restricted to the existing vacant land within the proposed incorporation area (Exhibit 3.4-3). For the purposes of this analysis, a 20-percent increase or decrease in the maximum allowable development intensity for each corresponding General Plan designation was assumed for the vacant land areas. This analysis then assumes that incorporation of the Arden Arcade would facilitate the urbanization on the existing vacant parcels consistent with Sacramento County General Plan land use designations.

#### Thresholds of Significance

For the purposes of this EIR, to determine whether impacts to hydrology and water quality are significant environmental effects, the following questions are analyzed and evaluated. Would the project:

- Violate any water quality standards or waste discharge requests?
- Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted?)
- Substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?
- Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner, which would result in flooding on- or off-site?
- Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?
- Otherwise substantially degrade water quality?
- Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?



- Place within a 100-year flood hazard area structures which would impede or redirect flood flows?
- Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?
- Inundation by seiche, tsunami, or mudflow?

### 3.4.5 - Impact Statements and Mitigation Discussions

#### Water Quality Standards and Requirements

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**Impact 3.4-1:**            **The project would not violate any water quality standards or waste discharge requests.**

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##### ***Impact Analysis***

Unincorporated county lands including the proposed incorporation area are currently included within the existing Phase I NPDES MS4 Permit. With the approval of the proposed incorporation, the new city would be required to become a signatory as a co-permittee and would be responsible for the initial cost of writing and submitting a Storm Water Management Plan to the RWQCB in order to comply with the NPDES MS4 Permit. In addition, the new city would be required to pay the annual NPDES Permit fee and pay for staff resources associated with the implementation of the County's Stormwater Quality Program. The new city would have the option to provide NPDES compliance services and activities directly, contract for them, or use a combination approach. Since compliance with the Permit will be required, the act of incorporation is not expected to result in violations of water quality standards and/or waste discharge requirements (WDRs).

##### ***Significance Determination Before Mitigation***

Less than significant impact.

##### ***Mitigation Measures***

No mitigation is required.

##### ***Significance Determination After Mitigation***

Less than significant impact.

#### Groundwater Supplies and Recharge

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**Impact 3.4-2:**            **The project would not 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 that would not support existing land uses or planned uses for which permits have been granted.**

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##### ***Impact Analysis***

The project is not expected to result in any direct increased groundwater consumption. Similar to existing conditions, the Sacramento County Department of Water Resources would continue to

actively manage its conjunctive water use program to optimize the use and management of local water supply sources, including surface and groundwater. These water supply sources would continue to be collectively delivered to local retail water agencies within the proposed incorporation area. The Sacramento County General Plan contains policies and implementation measures with the common goal of ensuring adequate, long-term quantity and high quality of groundwater resources, including objectives for the elimination of groundwater overdraft through conjunctive use management and managing growth to protect groundwater supply.

With no changes proposed in relation to the Sacramento County's existing General Plan policies and implementation measures, and a continuation of existing land use as part of the project, the proposed incorporation is not expected to result in increased depletion of existing groundwater supplies or interfere substantially with groundwater recharge. In this context, it is reasonable to conclude that the project would not directly or indirectly lead to increased rates of groundwater pumping, which could not support existing or planned land uses within the proposed incorporation area.

**Significance Determination Before Mitigation**

Less than significant impact.

**Mitigation Measures**

No mitigation is required.

**Significance Determination After Mitigation**

Less than significant impact.

**Alter Drainage Patterns and Create Erosion or Siltation**

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**Impact 3.4-3:**        **The project would not substantially alter the existing drainage pattern of area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on- or offsite.**

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**Impact Analysis**

The act of incorporation involves no new physical alterations to existing land surfaces and waterways within the proposed incorporation area. As the proposed incorporation area is generally built out with urbanized land uses, an assumed 20-percent increase or decrease in development intensity on remaining vacant lands based on maximum development intensity allowed under existing County General Plan land uses would affect less than 2 percent (1.2 percent) of the entire proposed incorporation area. This percentage is based a total of approximately 113 acres of vacant land within the 8,989-acre proposed incorporation area, with 36.00 acres designated commercial, 50.75 acres of LDR, and 26.50 acres of MDR. A 20-percent net increase from the maximum allowable (permitted) surface coverage on these vacant properties could reasonably be anticipated to produce higher runoff volumes, which in turn could require additional drainage facilities to attenuate such increased flows. However, given the fragmented nature of the vacant lands (Exhibit 3.4-3), the total net increase would be distributed throughout the various drainage facilities within the proposed incorporation rather than

being focused to any one facility. As a result, drainage impacts would be less than significant. Likewise, with decreased lot coverage, no corresponding increase in development intensity beyond what is currently allowed under the County General Plan would be anticipated.

Although no formal drainage calculations were completed as part of this EIR, given the small fraction of remaining developable land within the proposed incorporation area in conjunction with requirements of the County's MS4 Permit and Stormwater Management Plan, the effects of incorporation on localized drainage patterns and facilities are expected to be less than significant. Further, since the majority of drainage runoff within the proposed incorporation area is directed to County of Sacramento detention basin D-05, it is reasonable to conclude that the proposed incorporation would not require the alteration of a stream or river course in a manner that could result in substantial erosion or siltation, either within- or outside the proposed incorporation area. Based on these findings, drainage impact would be less than significant.

#### ***Significance Determination Before Mitigation***

Less than significant impact.

#### ***Mitigation Measures***

No mitigation is required.

#### ***Significance Determination After Mitigation***

Less than significant impact.

### **Alter Drainage Pattern and Create Flooding**

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<b>Impact 3.4-4:</b>	<b>The project would not 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 that would result in flooding on- or offsite.</b>
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#### ***Impact Analysis***

As previously discussed in Impact 3.4-3, since pre-existing development covers over 98 percent of the proposed incorporation area, and since existing drainage patterns are already highly modified in response to this level of development, the act of incorporation is not expected to substantially alter existing drainage patterns. Since the proposed incorporation area is highly urbanized and vacant lands constitute less than 2 percent of the area, the project would not result in a substantial increase in impervious surfaces that would lead to increased runoff that may lead to, or exacerbate, flood conditions within the city and downstream areas outside of the proposed incorporation area.

In addition, the proposed incorporation would not involve any physical disturbance to an existing stream or river; therefore, it is reasonable to conclude that the project would not alter the present course of a stream or river. Based on this reasoning, the impact is considered less than significant.

**Significance Determination Before Mitigation**

Less than significant impact.

**Mitigation Measures**

No mitigation is required.

**Significance Determination After Mitigation**

Less than significant impact.

**Drainage Capacity and Polluted Runoff**

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**Impact 3.4-5:**        **The project would not create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff.**

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**Impact Analysis**

The project does not involve any new forms of development that would create or contribute to increased impervious surfaces and associated runoff water. Given the fragmented nature of the remaining vacant lands and the existing regulatory policy framework currently in place, the proposed incorporation is not expected to exceed the capacity of existing or planned stormwater drainage systems. In addition, the new city will be subject the NPDES MS4 Permit and the adopted Storm Water Management Plan (SWMP); therefore, it is reasonable to conclude that compliance with the SWMP would ensure that the project does not indirectly lead to substantial contributions of additional sources of polluted runoff.

**Significance Determination Before Mitigation**

Less than significant impact.

**Mitigation Measures**

No mitigation is required.

**Significance Determination After Mitigation**

Less than significant impact.

**Water Quality**

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**Impact 3.4-6:**        **The project would not otherwise substantially degrade water quality.**

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**Impact Analysis**

Since the project would not involve any direct impacts to water quality (e. g., construction-related erosion, use of industrial chemicals) or any reasonably foreseeable indirect impact, the project would not substantially degrade existing water quality.

**Significance Determination Before Mitigation**

No impact.

*Mitigation Measures*

No mitigation is required.

***Significance Determination After Mitigation***

No impact.

**Housing Within Flood Hazard Area**

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**Impact 3.4-7:           The project would not place new 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.**

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***Impact Analysis***

The proposed incorporation area includes approximately 351 acres and 1,740 acres of land within the FEMA-designated 100-year flood zone and 500-year flood zone, respectively (Exhibit 3.4-1). As previously indicated, the vast majority of land within the proposed incorporation area is currently developed with mainly residential and commercial uses. As a result, portions of these developed areas are currently subject to hazards associated with the 100-year and 500-year flood events. This existing condition would apply regardless of whether incorporation actually occurs. Because the project would involve the adoption of the County General Plan, zoning ordinance, and land use regulations that currently discourage urban forms of development within delineated floodplains, it is reasonable to conclude that the project would not result in the placement of new housing and/or structures within a 100-year flood plain. Consequently, no impact is expected.

***Significance Determination Before Mitigation***

No impact.

***Mitigation Measures***

No mitigation is required.

***Significance Determination After Mitigation***

No impact.

**Impede or Redirect Flood Flows**

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**Impact 3.4-8:           The project would not place structures within a 100-year flood hazard area that would impede or redirect flood flows.**

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***Impact Analysis***

The project would not require the placement of any structures within a waterway or a designated 100-year flood hazard area that could impede or redirect flood flows.

***Significance Determination Before Mitigation***

No impact.

### **Mitigation Measures**

No mitigation is required.

### **Significance Determination After Mitigation**

No impact.

### **Exposure of People and Structures to Flooding**

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**Impact 3.4-9:**        **The project would not 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.**

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### **Impact Analysis**

Folsom Dam and the American River levees provide localized flood protection for the existing residents of Arden Arcade. The American River Flood Control District (ARFCD) maintains the federal flood control project levees along the American River to the south and west of the proposed incorporation area.

The floods of 1986 and 1997 and, more recently, Hurricane Katrina have brought to the forefront a heightened awareness of the danger to the Sacramento Valley posed by unpredictable periods of prolonged rainfall following heavy snow in the upper watersheds. This realization reinforces the concept of responsible floodway management, with emphasis on levee maintenance, and its importance to the protection of life and property. Levees typically fail in one of two ways: (1) overtopping of the levee during peak flows or (2) structural failure. Both types of failure can result in deep flooding within the adjacent floodplain.

The risk to structures built behind a levee system could come from a minor, major, or catastrophic failure of the levee. However, no new structures or growth areas are proposed as part of the proposed incorporation that would face risks currently faced by existing occupants of the proposed incorporation area. Other areas of California face similar risks from natural disasters including earthquakes, mudslides, wildfires, and inundation as a result of dam failure. However, the regulatory framework developed to address these hazards and fund the necessary improvements is generally better established. Levees are regulated at the state level with maintenance activities delegated to reclamation districts. The proposed city would have no jurisdiction and is limited in terms of alternatives to mitigate for the identified risks beyond facilitating the establishment of local funding mechanisms.

Nevertheless, since the proposed incorporation involves no encroachment into an existing levee and creates no new growth areas that would be newly subjected to indirect flooding, the impact would be less than significant. As a result, the proposed incorporation would not result in a significant risk of loss, injury, or death from flooding.

**Significance Determination Before Mitigation**

Less than significant impact.

**Mitigation Measures**

No mitigation is required.

**Significance Determination After Mitigation**

Less than significant impact.

**Inundation By Seiche, Tsunami, or Mudflow**

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**Impact 3.4-10:        The project would not be inundated by seiche, tsunami, or mudflow.**

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**Impact Analysis**

Seiches are standing waves on enclosed or restricted bodies of water, such as lakes and reservoirs, caused by a disturbance such as wind or earthquakes. Lake Natoma and Folsom Lake are located upstream of the proposed incorporation area and could reasonably be subject to seismic ground motion, which, in turn, could create a small seiche. Given the considerable distance of these water bodies from the proposed incorporation area, there is a very low risk of a seiche directly affecting the proposed incorporation area. Based on the low expected peak ground acceleration for the proposed incorporation area and areas east, the risk of a seiche indirectly affecting the proposed incorporation area is minimal. Therefore, incorporation would not create any new risk of inundation by seiche.

The proposed incorporation area is located approximately 80 miles from the Pacific Ocean at an elevation of approximately 350 feet. Therefore, the proposed incorporation area is not at risk of inundation from a tsunami.

The land within the proposed incorporation area is generally flat, lacking the relief necessary for a mudflow to occur. Therefore, incorporation would not create a risk of inundation from a mudflow.

**Significance Determination Before Mitigation**

No impact.

**Mitigation Measures**

No mitigation is required.

**Significance Determination Before Mitigation**

No impact.