3.1 HYDROLOGY

This section discusses local and regional hydrologic conditions, current channel conditions, expected channel evolution, potential changes in drainage patterns, flooding, and erosion in the Project Area. The section describes the interrelationship of these factors and the potential for the Project to impact them.

Analyses in this section are based on review of Federal Emergency Management Agency (FEMA) Flood Maps, a Geomorphology Assessment (Stillwater Sciences, 2014), and the Putah Creek Watershed Management Action Plan (WMAP) (EDAW, 2005), among other sources.

Water quality issues are discussed in Section 3.2, *Water Quality*. Section 3.14, *Utilities and Service Systems*, addresses water supply and associated systems.

The following CEQA Guidelines Appendix G hydrology topics are not addressed in this PEIR because the Project has no potential to affect them:

- 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)
- 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

3.1.1 Setting

Environmental Setting

Climate and Precipitation

The Putah Creek watershed has a Mediterranean climate of hot dry summers and mild rainy winters. Approximately 75 percent of the annual rainfall is received between November and March, the typical rainy season. Near the headwaters of Putah Creek in the Coast Range, 40 to 60 inches of rain falls annually, while the City of Davis, on the lower portion of Putah Creek, averages about 17 inches per year (EDAW, 2005, p. 1-8).

Regional Drainage

The Putah Creek watershed lies along the eastern flank of the California Coast Range and the western side of the Central Valley, within USGS hydrologic unit code (HUC) 18020109. In all, the 90-mile-long creek drops over 3,540 feet and drains a watershed area of approximately 660 square miles. The Putah Creek watershed is bordered by the watersheds of Cache Creek to the north and Napa River to the southwest.

Below Monticello Dam, the creek flows through a 6.7-mile-long "inter-dam" reach between the dam and Putah Creek Diversion Dam (PDD), where the creek emerges from the Coast Ranges. Tributaries to Putah Creek below Monticello Dam include Thompson Creek, Cold Creek, Bray Canyon Creek, and Pleasants Creek above the PDD, and McCune/Pleasant Creek and Dry Creek downstream of the PDD. Below the PDD and entering the Project Area (the upper reach of lower Putah Creek), Putah Creek flows eastward for approximately 26 miles, past the cities of Winters and Davis, and through the Yolo Bypass where it reaches the toe drain (see Figure 1-2 in Chapter 1, *Introduction*). The toe drain eventually joins the Sacramento-San Joaquin River Delta after following a straight, 20-mile long course along the Yolo Bypass.

Through the Project Area, Putah Creek flows along the bottom of a deeply incised corridor. Water surface elevations are typically 28 to 32 feet below the terrace elevations (City of Winters 2008, p. 12). The portion of the creek within the Project Area includes several long, deep, and wide pools created by historic mining activities. These pools reduce flow velocities and accelerate warming of the creek. The pools range in size from approximately 1.5 to 27 acres and are located in the following Project reaches: Duncan-Giovannoni, Upper McNamara, Lower McNamara, Russell Ranch, Stevenson Bridge, Glide Ranch, Olmo-Hammond-UCD, Old Davis Road to Mace, Mace to Road 106A, and Road 106A to Yolo Bypass Wildlife Area (YBWA).

An earthen dam at Road 106A, about 3 miles upstream of the Los Rios Check Dam forms a seasonal barrier to Putah Creek flows. Under a California Department of Fish and Wildlife (CDFW) permit, a plug of earth is pushed annually across the stream channel at this point. Downstream of the Project Area, the Los Rios Check Dam—a 30-foot-wide concrete dam, fitted with wooden flash-boards—is operated in conjunction with installation of the flash-boards at the dam at Road 106A to control the hydrology of the lower creek. From approximately from April 1 to December 1, to these dams are operated to form a pool of water for diversion to irrigation canals, and are also operated to impound water for irrigation and flood-up of wetlands managed by CDFW (Stillwater Sciences, 2014, p. 5). The check-dam boards and the soil plug are removed to provide fish passage in the winter rainy season.

Lower Putah Creek Flows

Historically, the inherently unpredictable nature of runoff in the upper watershed and flooding in the Yolo Basin resulted in substantial year-to-year variability in streamflow and overbank inundation patterns along Lower Putah Creek. Completion of the Solano Project in 1957 has led to a dramatic reduction in peak streamflow downstream; the post-dam 100-year peak flow is about one-fifth of the pre-dam peak flow. The creek historically discharged to the Yolo Basin with occasional through-flow farther into the north Delta during the highest flows (Whipple, *et al*., 2012; as cited in Stillwater Sciences, 2014, p. 12). The lower creek is believed to have been intermittent during most water years, as the upper watershed tributaries would usually run dry in summer months. Most low flows in the creek were wholly maintained by shallow groundwater inflow (Yates, 2003; EDAW, 2005; as cited in Stillwater Sciences, 2014, p. 12).

Since completion of the Solano Project, peak flows in the lower creek have been limited to high run-off from tributary inputs below the dam, such as McCune/Pleasant Creek or occasionally Dry Creek, or the considerably less frequent events when the Lake Berryessa rises to its upper level and spills via its glory hole. With the deeply incised channel and regulated flood flows after the Solano project, all peak flows have been contained within the confines of the upper terrace elevations (City of Winters, 2008, p. 12).

Currently, daily mean flows through the inter-dam reach are much reduced in the rainy season ranging from 10-15 cubic feet per second (cfs) compared with historic conditions. Conversely, baseflows in July through October are greater than historic

flows, ranging from a high of 43 cfs in July to a low of 20 cfs in September and October (SCWA, 2015).

The majority of the Putah Creek flows are diverted into the Putah South Canal at the PDD for irrigation, municipal, and industrial uses. Annual average diversion into the canal between water years 1995 and 2013 (excluding water year 1998) was approximately 190,000 acre-feet (USGS, 2014; as cited in Stillwater Sciences, 2014, p. 13; USGS 2007). Monthly mean flows in Putah Creek over this same time period were greatest between May and September (300 to 600 cfs) and lowest between November and February (40 to 60 cfs) (USGS, 2014; as cited in Stillwater Sciences, 2014, p. 13; SCWA 2015, p. 1). Between water years 2004 and 2013, the majority of streamflow reaching Lake Solano at PDD was routed into the Putah South Canal even during the large winter flow events in 2004, 2005, and 2006 (Stillwater Sciences, 2014, p. 13).

In May 2000, the Putah Creek Accord formally regulated seasonal flow releases by Solano County Water Agency (SCWA) and Solano Irrigation District (SID) from Putah Diversion Dam to ensure minimum instream flows to chiefly benefit aquatic and riparian resources in the lower creek. Four flow-requirement categories, rearing flows, spawning flows, supplemental flows, and drought-year flows were established in the Accord. The minimum daily "rearing flows" to be maintained in the lower creek are summarized in **Table 3.1-1**. The Accord calls for the highest flows during the late spring and early summer months (April-July). Finally, "drought year flows" with reduced minimum flow releases from Putah Diversion Dam are triggered when total storage in Lake Berryessa is less than 750,000 acre-feet. Maintenance of continuous flows downstream of I-80 is not required under drought conditions; however, to date, this condition has not been triggered as storage in Lake Berryessa has maintained at least 900,000 acre-feet (USBR, 2014; as cited in Stillwater Sciences, 2014, p. 16).

Table 3.1-1 Minimum Daily Required "Rearing Flows" to be Recorded at Two SCWA-Operated Gaging Stations on Lower Putah Creek

SCWA Gaging Station	Water Year Type	Minimum Daily Required "Rearing Flows" (cfs)											
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
PDD	Normal	20	25	25	25	16	26	46	43	43	43	34	20
	Drought	20	25	25	25	16	26	46	43	43	43	34	20
I-80	Normal	5	10	10	15	15	25	30	20	15	15	10	5
	Drought	2	2	2	2	2	2	2	2	2	2	2	2

Source: Stillwater Sciences, 2014; Table 3, p. 16.

The Accord also stipulates that "spawning flows" must be released below the PDD as a 3-day pulse with associated minimum flows and gradual ramp-down rates between February 15 and March 31 of every year: 150 cfs for the first 24 hours, 100 cfs for the second 24 hours, and 80 cfs for the third 24 hours. The "supplemental flows" require that flows of at least 50 cfs be maintained at the point where Putah Creek discharges into the toe drain for five consecutive days each year between November 15 and December 15. This pulse is coordinated with removal of the flash-boards at Los Rios Check Dam. Removal of the earthen dam at Road 106A generally coincides with this activity.

Since the Accord was enacted, flows released from the Putah Diversion Dam into Lower Putah Creek have averaged approximately 40 cfs. Flows events with greater peaks and duration occur due to increased uncontrolled run-off, particularly from Dry and McCune creeks. Since the construction of Monticello Dam, peak flows have been attenuated from an estimated daily average of approximately 18,000 cfs to 8,000 cfs, with the pre-dam instantaneous peak of over 50,000 cfs dropping to the post-dam peak of approximately 18,000 cfs (City of Winters, 2008, p. 12; USGS, 2015). Between Monticello Dam and Putah Diversion Dam, instantaneous peak flows have measured 15,000-18,000 cfs during flood events (in 1970, 1983, and 1997) (County of Yolo, 2005, p. 4-39 and Figure 4-39). Peak flows of about 12,500 cfs occurred on this reach in January 2006 (SCWA streamflow data).

Once the capacity of Lake Berryessa's reservoir pool is exceeded and the glory hole begins to spill, flood events both upstream and downstream of the PDD are similar to the natural instantaneous peak discharges prior to the dam construction. A release of over 14,000 cfs was recorded in March of 1983. Solano County Water agency records indicate that inflow to Lake Berryessa during the December 2002 flood may have been in excess of 90,000 cfs (City of Winters 2008, p. 12). While the lake buffered the full effect of this flood in the Project Area, flows through the proposed Project Area still likely reached several thousand cfs due to input from tributaries below the dam (City of Winters, 2008, p. 12).

In summer months, daily flows are shown to decrease downstream along the length of the creek, which are likely due to infiltration losses to the subsurface, evapotranspiration from aquatic and riparian vegetation, surface water pumping from the creek, and nearby groundwater pumping. An unusual set of flow conditions occurs roughly three out of 10 years, when backwater conditions are induced on the lowest reaches of the Creek by high flows in the toe drain or even flooding of the Yolo Bypass

(Stillwater Sciences, 2014). Under these conditions, Putah Creek's flow velocity nears zero, flow in the creek is significantly less than in the Yolo Bypass, and thus the flow essentially builds up at the mouth of the bypass.

Under ordinary conditions, all tributary flows into the Project Area are seasonal, because there are no perennial waterways flowing into Putah Creek within the Project Area.

Lower Putah Creek Sediment Transport

Downstream of the PDD, changes to Putah Creek channel form have largely been caused by dams blocking larger coarse sediment transport, direct manipulation of the channel for flood protection and gravel mining operations, and diversion of streamflows into of the South Fork canal (EDAW, 2005, pp. 4-19 and 4-20). Following completion of the Solano Project in 1957, water released from the PDD became relatively sediment-free, or "sediment-starved" because sediments settled out in the reservoir behind the Dry Creek dam rather than continue downstream. Fine sediments, such as silt and sands, are still transported over the dam, but coarse sediment, such as gravel and cobbles, are not. When sediment-free water flows over existing sediment it has an increased capacity to entrain, or pick up and carry, particles from the bed and banks, which can contribute to continuing channel scour and erosion along lower Putah Creek.

The only consistent source of coarse sediments to the Lower Putah Creek channel is from Dry Creek, which now delivers only a fraction of the course sediments supplied prior to the Solano Project. While sediments (and woody debris) are occasionally flushed through the sluice gates at PDD, nearly all are fine-grained materials (Yates, 2003; EDAW, 2005; as cited in Stillwater Sciences, 2014, p. 26). Thus, the lower creek is effectively starved of coarse-grained sediments. The high proportion of fine sediments has degraded water quality and aquatic habitat conditions (EDAW, 2005; as cited in Stillwater Sciences, 2014, p. 26). These issues are addressed in the Water Quality and Biological Resources sections of this document, respectively.

Along the length of Lower Putah Creek, bed material generally transitions from predominantly sand and gravel near Winters to predominantly sand, silt, and clay near the YBWA (NHI *et al*., 2002; Yates, 2003; as cited in Stillwater Sciences, 2014, p. 26). Mean particle sizes (D50) between PDD and Pedrick Road bridge (just east of Davis and the North Fork split) show a general trend of coarser bed material near Winters to finer bed material towards the Mace Boulevard bridge. Limited field observations in 2012 support these trends, which continue through the YBWA Reach to the toe drain. Bank

substrates throughout are fine-grained, being composed mostly of silty/sandy loams, with some clay and gravels.

Flood Hazards

The Federal Emergency Management Agency (FEMA) produces Flood Insurance Rate Maps (FIRMs) that identify flood-prone areas. The FIRMs for the Project Area show the majority of the Project Area is in the 100-year flood zone (Zone A), with some areas designated as Zones X, AO (river or stream flood hazard areas with a 1 percent or greater chance of shallow flooding), or AE (areas subject to inundation by a 100-year flood event, for which base flood elevations have been established) (FEMA, 2014a.). In the Project Area, flood hazards take four general forms:

1. Some 100-year flood zones occur exclusively within the confined channel because it is incised.
2. Some 100-year flood zones involve the channel overtopping into the shallow upland flood areas, primarily in the City of Davis and downstream to the bypass.
3. Some 100-year flood zones involve flooding from upland areas that drain into the creek via existing tributary channels, and this occurs primarily in areas around the City of Winters.
4. Some 100-year flood zones are associated with sheet flow across the landscape, flowing generally towards the Yolo Bypass, parallel to the creek. This occurs in the last two reaches of the Project Area, downstream of the City of Davis.

Detailed descriptions of flood-prone areas along the Project alignment are presented below, in “Project Area Conditions by Reach.”

Project Area Conditions by Reach

Reach-by-reach information on hydrologic conditions is described below. Flood hazards are described below and shown generally on **Figures 3.1-1A** through **3.1-1D**, FEMA flood hazard maps.

NAWCA/Mariani

Outside sources of seasonal flow in this reach include McCune/Pleasant Creek. McCune Creek drains areas south and west of the Project Area and enters the creek and Project Area in the first third of the reach. The stream channel is deeply incised, and the 100-year floodplain in this reach is largely contained within it.

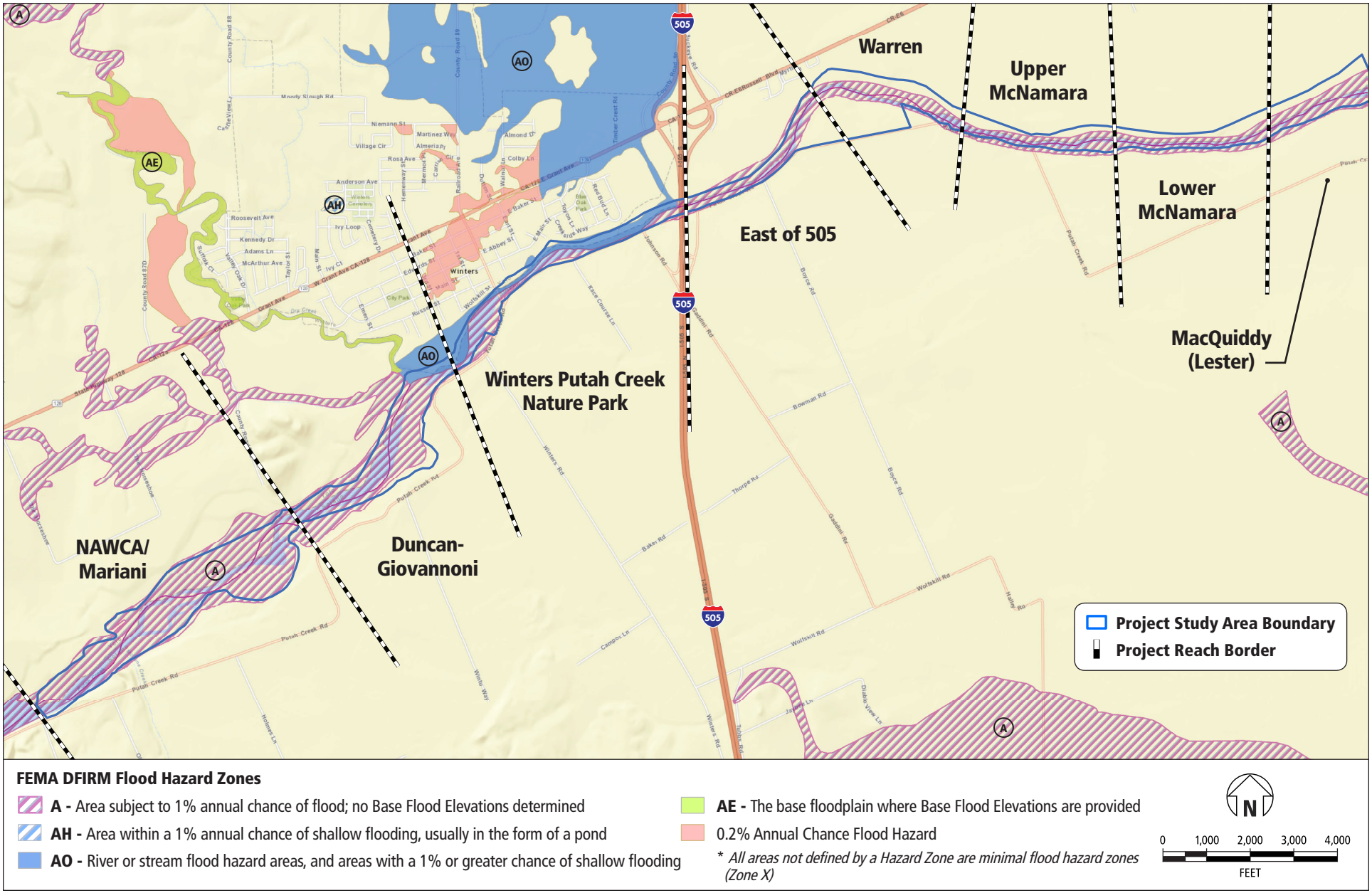

Figure 3.1-1A

FEMA Mapped Flood Zones

Source: FEMA

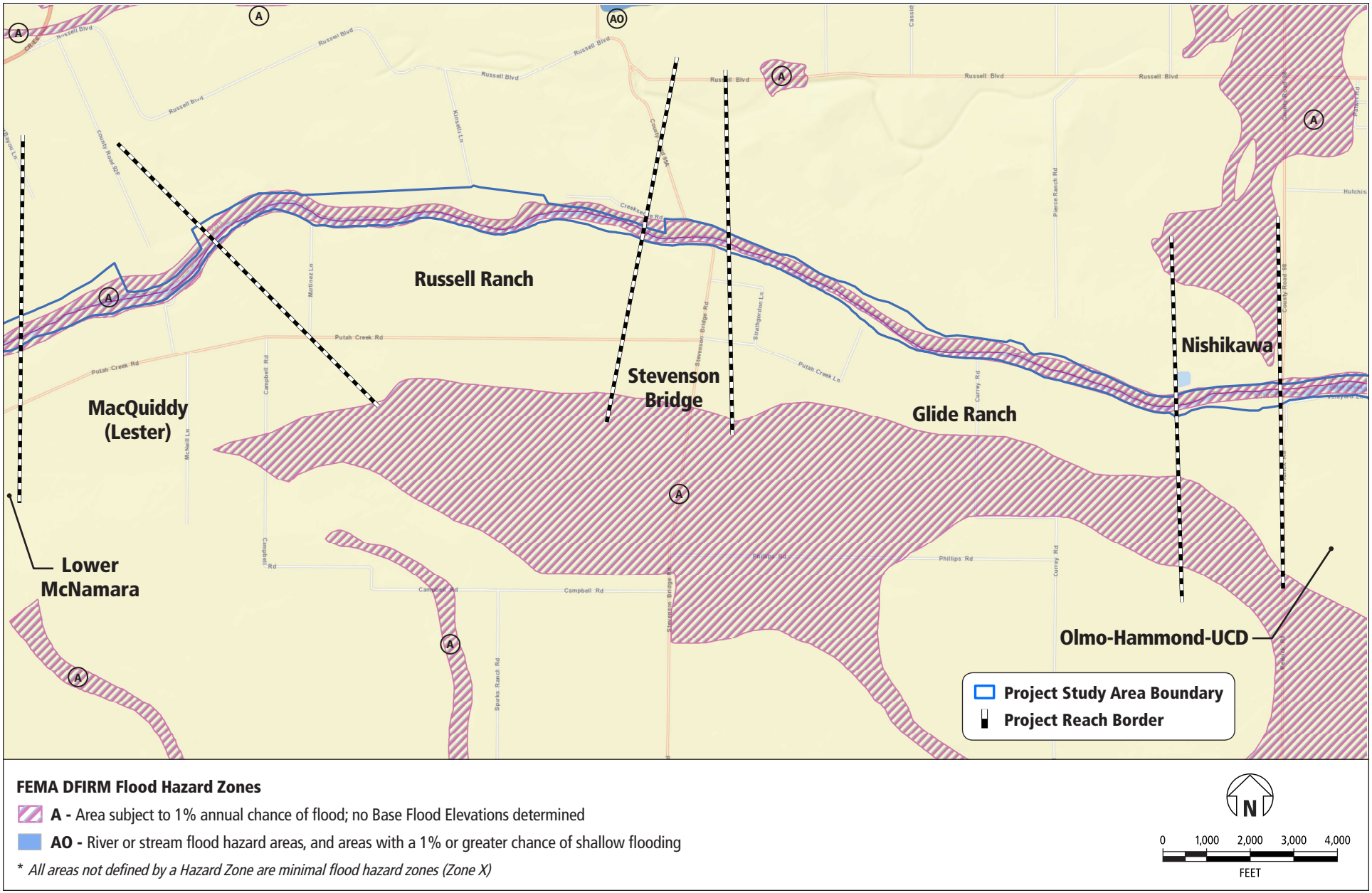

Figure 3.1-1B

FEMA Mapped Flood Zones

Source: FEMA

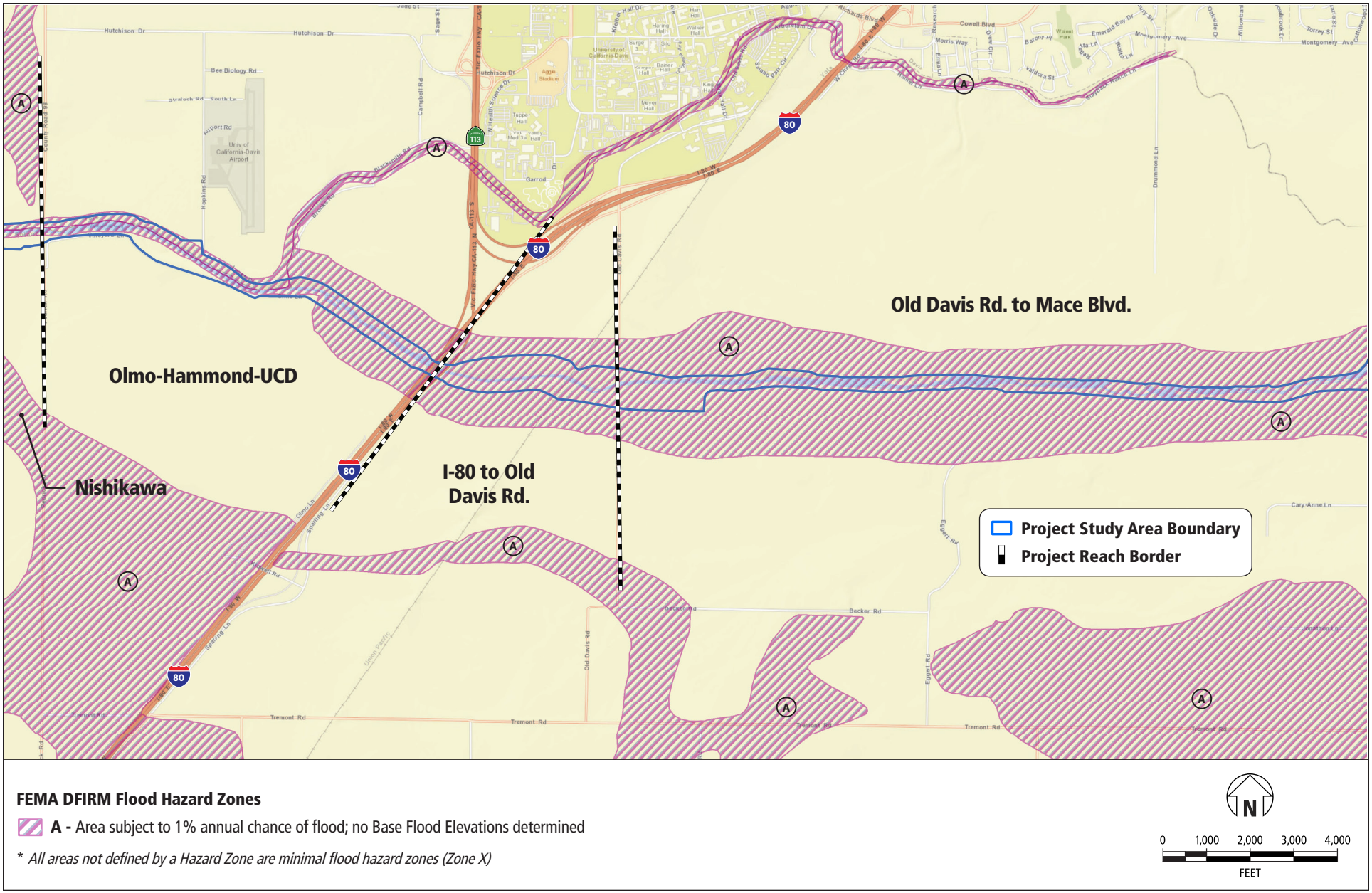

Figure 3.1-1C

FEMA Mapped Flood Zones

Source: FEMA

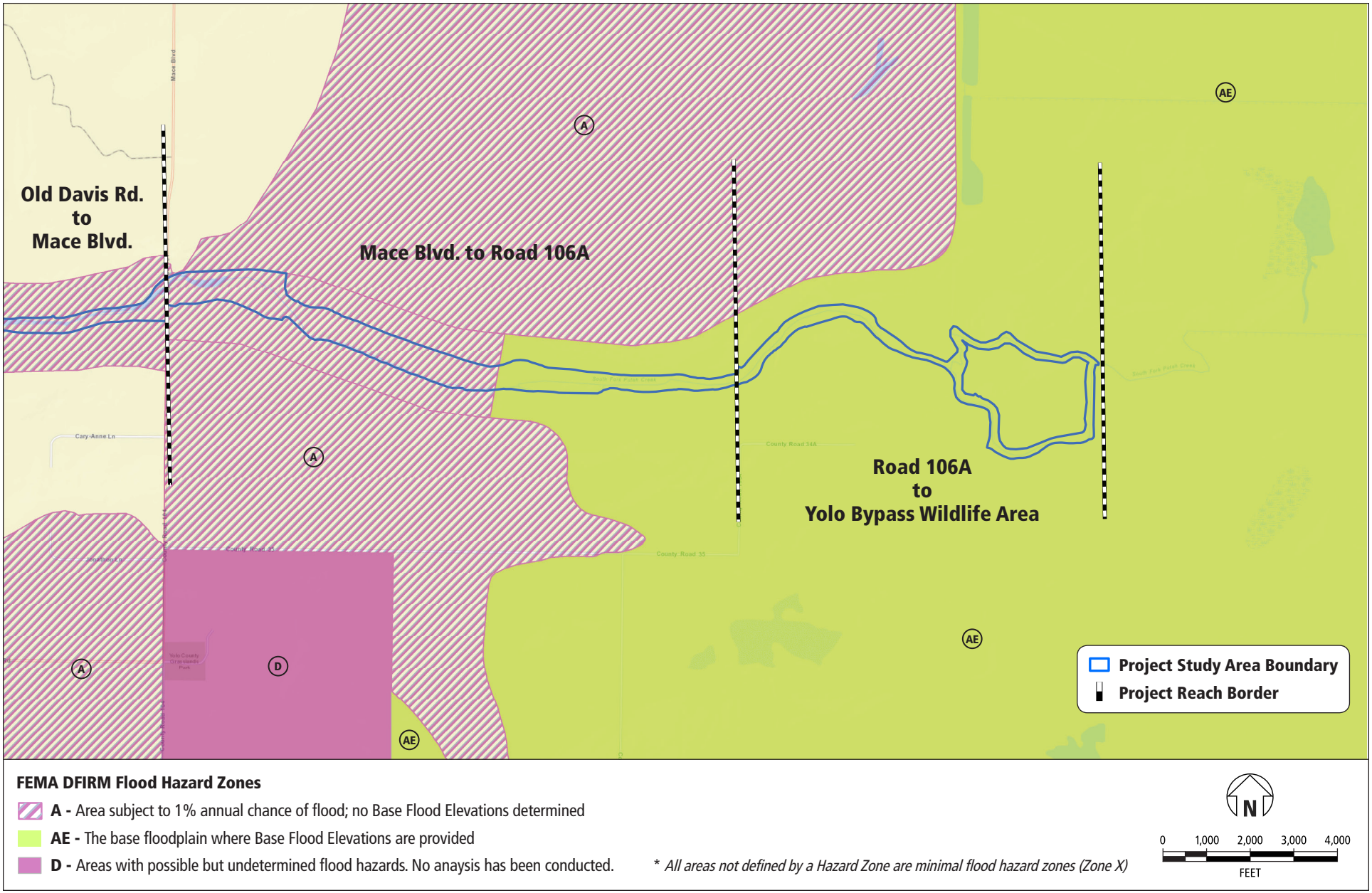

Figure 3.1-1D

FEMA Mapped Flood Zones

Source: FEMA

In the northeastern, downstream portion of this reach, the FEMA mapped floodplain extends beyond the top of the bank in three locations. These locations include land used as orchards and a large private residence with agricultural outbuildings that extends downstream into the vicinity of the Duncan-Giovannoni reach.

Duncan-Giovannoni

This is a transitional reach from the wider floodplains to what was one of the sections of the creek with the greatest pools and most incised floodplains. Dry Creek, a major tributary that flows from northwest and west of the Project Area, enters Putah Creek near the southwest corner of the City of Winters. Dry Creek's seasonal flows are flashy, with brief periods of high flows followed by long periods of no flow. A prior restoration on Dry Creek has stabilized downcutting in the reach, and Dry Creek is now one of the leading contributors of sediment to naturally rebuild the floodplain. However, approximately 5 acres of in-channel pools remain in the reach, increasing water temperatures.

The mapped floodplain is largely within the creek banks in this reach because the channel is highly entrenched and evolved to handle much higher pre-dam flows. This is not a leveed reach. Flood risk is minimal on the southern boundary of the reach. In the southwestern, upstream portion of this reach, the mapped floodplain extends beyond the top of the bank and beyond the Project Area. Areas mapped as subject to 100-year flooding include orchards and a large private residence with agricultural outbuildings (same as described above for NAWCA/Mariani reach).

Mapped 100-year flood plains occur in the northern part of this reach, due to the influence of McCune/Pleasant Creek and Dry Creek, which back up at their confluences with Putah Creek under 100-year flood conditions. Within the Project Area, 100-year flood flows remain within the incised Putah Creek channel, but just upstream on the tributaries, flooding occurs due to backed-up water.

Winters Putah Creek Nature Park

Through previous restoration activities, previously mined pools have been filled and the floodplain in this reach has been recontoured to design grades. Under non-flood conditions, there are no significant contributors to creek flow within this reach. The channel in this reach is incised and evolved to handle the higher pre-dam flows.

In most of the reach, 100-year flood flows remain within the channel. However, as in the Duncan-Giovannoni reach, the FEMA map for this reach depicts a backwater effect at

the confluence of Dry Creek and Putah Creek, south of the City of Winters, which leads to shallow flooding outside of the channel in the upstream end of the reach. During 100-year flood events, there is also shallow flooding along an intermittent channel at the northeast end of the reach, west of Interstate 505 (I-505). In both the cases of Dry Creek and the unnamed shallow upland runoff drainage, Putah Creek's flood remains in the channel, and flooding backs up along the tributary channels.

East of 505

There are no significant contributors to seasonal flow or runoff within this reach. The channel in this reach is deeply incised and not leveed.

The mapped 100-year floodplain in this reach extends somewhat outside of the top of the bank, outside of the Project boundaries, on the north bank of the creek, directly east of I-505 and south of an agricultural packing facility. In this reach, 100-year flood flows remain within the incised, confined channel.

Warren, Upper McNamara, Lower McNamara

There are no significant contributors to seasonal flow or runoff within these reaches. Because the creek channel is deeply incised, the mapped floodplain is largely contained within the creek channel. The 100-year mapped floodplain does not appreciably extend beyond the top of the channel in these reaches, which are all un-leveed. The Upper McNamara Reach contains approximately 5 acres of in-channel pools and Lower McNamara contains approximately 7 acres, increasing water temperatures in these reaches.

MacQuiddy (Lester)

There are no significant contributors to seasonal flow or runoff in this reach. Because the creek channel is deeply incised, the 100-year flood flows remain within the channel. This is not a leveed reach.

The mapped 100-year floodplain in this reach extends somewhat outside of the Project Area on a portion of the north bank of the creek. The Project Area boundaries have been narrowed in this area due to the presence of private property, including an orchard and a rural residence abutting the creek.

Russell Ranch

There are no significant contributors to seasonal flow or runoff in this reach. The creek channel is deeply incised, and so the 100-year floodplain is largely within the channel.

This is not a leveed reach. This reach contains approximately 7 acres of in-channel pools, which have resulted in increased water temperatures.

The mapped 100-year floodplain extends somewhat outside of the Project Area on a portion of the north bank of the creek in the far eastern, downstream end of the reach. The Project Area boundaries have been narrowed in this area due to the presence of a rural subdivision that extends eastward.

Stevenson Bridge

There are no significant contributors to seasonal flow or runoff in this un-leveed reach. The creek channel is deeply incised, keeping the 100-year flood flows remain within the channel. This reach contains approximately 1.5 acres of in-channel pools, which have resulted in increased water temperatures.

As in the Russell Ranch reach, the mapped 100-year floodplain extends somewhat outside of the Project Area on a portion of the north bank of the creek in the western (upstream) end of the reach. The Project Area boundaries have been narrowed in this area due to the presence of a rural subdivision.

Glide Ranch, Nishikawa

There are no significant contributors to seasonal flow or runoff in either of these reaches. In both reaches, the100-year floodplain is largely within the creek banks because the creek channel is deeply incised. The 100-year mapped floodplain does not appreciably extend beyond the Project Area in these reaches. The Glide Reach contains approximately 7 acres of in-channel pools, which have resulted in increased water temperatures.

Olmo-Hammond-UCD

There are no significant contributors to seasonal flow or runoff in this reach. In the upstream half of this reach, the creek is in an unleveed, incised channel, so the FEMA mapped floodplain is mostly within the creek banks, and 100-year flood flows remain within the channel. This reach contains approximately 17 acres of in-channel pools, which have resulted in increased water temperatures.

On the north bank, somewhat east of the middle of the reach, a smaller side branch of the creek splits off along the north bank of the creek. This northern side branch, which runs through the southern edge of the campus of the University of California, Davis (UC Davis) and then the City of Davis, is part of the historic channel of Putah Creek (not part

of the Project). From this divergence point eastward, the main branch of the creek, including the Project Area, enters an engineered, leveed channel. In this area, the 100-year mapped floodplain extends considerably beyond both leveed banks of the creek. Shallow flooding occurs in this area about one out of every 3 years.

I-80 to Old Davis Road, Old Davis Road to Mace

Both of these reaches are located in an area of flatter topography in which the channel is less incised. These reaches are located within the engineered, leveed channel, which ends at Mace Boulevard/Road 104. The 100-year mapped floodplain extends considerably beyond both banks of the creek in these reaches. The Old Davis Road to Mace Reach contains approximately 27 acres of in-channel pools, which have resulted in increased water temperatures.

These reaches receive treated wastewater from the UC Davis Wastewater Treatment Plant (UCD WWTP), which discharges treated wastewater from an outfall east of Old Davis Road, on the border between the two reaches (UC Davis, 2004, pp. 3-3 to 3-4 and Exhibit 3-2). The plant also discharges treated wastewater to the Arboretum Waterway on the UC Davis campus, outside of the Project Area (CVRWQCB, 2014, pp. 24 and F-2 to F-3). This waterway is located in the historical channel of the former North Fork of Putah Creek and is confined at both ends and used for stormwater management. The flow from the Arboretum Waterway is blended with stormwater and then pumped to Putah Creek (CVRWQCB, 2014, p. F-4).

The plant discharges a continuous flow to Putah Creek that averages approximately 2.5 cfs (EDAW, 2005, pp. 4-12 and 4-27; SWRCB, 2015a, p. 3; SWRCB, 2015b, p. 3). Under the flow regime instituted under the Putah Creek Accord, during normal, non-drought years, minimum mean daily flows measured at the I-80 gaging station in this section of the creek range from a low of 5 cfs in October to a high of 30 cfs in April (see Table 3.1-1; Sacramento Superior Court 2002, Exhibit A, pp. 1 to 2). Under these conditions, the plant makes a modest contribution to flow in this area of Putah Creek during the wetter months of the year. However, during drought years, the Putah Creek Accord requires minimum mean daily flow of only 2 cfs, and so under drought conditions, the plant makes a sizable contribution to flow in this portion of the creek.

Mace to Road 106A

There are no significant contributors to seasonal flow or runoff in these reaches. This reach is located within the floodplain of the Yolo Bypass and so is subject to flooding both inside and outside of the levee. One hundred-year flood events here are associated

with sheet-flow across the land, towards the Yolo Bypass, as well as shallow flood flow from the north that stops at the levee. At Road 106A at the far eastern edge of the reach, an earthen push-up dam is placed across the stream channel to impound water during the agricultural irrigation season, resulting in a long, wide pool of approximately 17 acres.

Road 106A to Yolo Bypass Wildlife Area

This reach contains approximately 11 acres of in-channel pools, which have resulted in increased water temperatures.

There are no significant contributors to seasonal flow or runoff in this reach. Like the Mace to Road 106A reach, this reach is located entirely within the floodplain of the Yolo Bypass and so is subject to flooding both inside and outside of the leveed channel, and 100-year flood events here are associated with sheet flow across the land, towards the Yolo Bypass. The earthen push-up dam at Road 106A on the far western edge of the reach (the dividing line between this reach and the Mace to Road 106A reach) controls flows into this reach in the summer months. The channel has very stable water levels due to the impoundments caused by the barriers at each end (the Los Rios check dam backs up water into this reach). In the eastern half of the reach, a seasonal overflow channel is located at the point where the channel forks (see Figure 3.1-1d). Shallow flooding in this area occurs about one out of every 3 years.

Regulatory Setting

Federal Regulations

U.S. Army Corps of Engineers

The U.S. Army Corps of Engineers (USACE) implements the federal Clean Water Act Section 404. Any person, firm, or agency planning to alter or work in navigable waters of the U.S., including the discharge of dredged or fill material, must first obtain authorization from the USACE. Section 10 of the Rivers and Harbors Act of 1899 prohibits the obstruction or alteration of navigable waters of the U.S. without a permit from the USACE (33 U.S.C. Section 403). Section 301 of the Federal Water Pollution Control Act and Amendments of 1972 (CWA) prohibits the discharge of pollutants, including dredged or fill material, into waters of the U.S. without a Section 404 permit from USACE (33 U.S.C. Section 1344).

Putah Creek is a first-order tributary to the Sacramento River, and all tributaries to the Sacramento River are considered jurisdictional waters of the U.S. pursuant to Section

404 of the Clean Water Act (CWA) (USACE, 1987, p. 2; 33 CFR Section 328.3; cited in BSK, 2014, p. 4). In order to assess which portions of the Project Area are located within jurisdictional "waters of the US" a field survey was completed to determine the OHWM (BSK, 2014).

USACE Regional General Permits

USACE oversees approval of Regional General Permits (RGPs) and Programmatic General Permits (PGPs) that are developed to avoid unnecessary regulatory control over activities that do not justify individual control or which are adequately regulated by another agency (33 CFR 320.1(a)(3)). These permits are issued for a category or categories of activities when: (a) those activities are substantially similar in nature and cause only minimal individual and cumulative environmental impacts; or (b) the RGP/PGP would result in avoiding unnecessary duplication of the regulatory control exercised by another federal, state, or local agency, provided it has been determined that the environmental consequences of the action are individually and cumulatively minimal.

As part of the permitting process for the proposed Project, a Regional General Permit is being sought for dredge and fill activities and associated maintenance associated with stream channel rehabilitation and riparian restoration activities in waters of the U.S. within the Project Area.

State Regulations

California Department of Fish and Wildlife

The California Department of Fish and Wildlife (CDFW) administers Lake and Streambed Alteration Agreements (LSAAs) pursuant to Fish and Game Code Section 1600 *et seq*. for any activity that will divert or obstruct the natural flow of any river, stream, or lake; change the bed, channel, or bank, including associated riparian or wetland/marsh resources, or use material from the stream channel bed. CDFW may require an LSAA for the proposed Project. CDFW is also a Responsible Agency for the proposed Project under CEQA and will review this PEIR (CDFW, 2015, p. 4).

Central Valley Regional Water Quality Control Board

The Central Valley Regional Water Quality Control Board (CVRWQCB) regulates water quality in the region surrounding the Project Area. CVRWQCB oversees enforcement of Section 401 of the federal Clean Water Act (CWA) through the Section 401 Water Quality Certification process where development results in fill of jurisdictional wetlands

or waters of the U.S. under Section 404 of the CWA. For additional discussion of CVRWQCB regulations, see Section 3.2, *Water Quality*.

Central Valley Flood Protection Board

Under state Water Code Section 8520 *et seq*., the Central Valley Flood Protection Board (CVFPB) administers permits for any project that may encroach upon, improve, alter or affect adopted plans of flood control, including federal/state flood control systems, regulated streams and designated floodways under the Board's jurisdiction (CVFPB, 2014). It is anticipated that a CVFPB Encroachment Permit would be sought for the Project.

Local Regulations

Local regulation of water quality, hydrology, and flood protection is contained in the Solano and Yolo County General Plans, Municipal Codes, and other planning documents.

Solano County General Plan

The following Solano County General Plan objectives, policies, and implementation actions are relevant to the proposed Project (County of Solano, 2008, pp. HS-12).

Policies

HS.P-2: Restore and maintain the natural functions of riparian corridors and water channels throughout the county to reduce flooding, convey stormwater flows, and improve water quality.

HS.P-3: Require new developments to incorporate devices capable of detaining the stormwater runoff caused by a 100-year storm event or to contribute to regional solutions to improve flood control, drainage, and water recharge.

HS.P-6: Work with federal, state, and local agencies to improve flood control and drainage throughout the county.

HS.P-9: Preserve open space and agricultural areas that are subject to natural flooding and are not designated for future urban growth; prohibit permanent structures in a designated floodway where such structures could increase risks to human life or restrict the carrying capacity of the floodway.

Implementation Programs (County of Solano, 2008, pp. HS-12 to HS-19)

HS.I-5: Require periodic stream maintenance by private property owners, and undertake regular stream maintenance by the appropriate public agencies.

HS.I-6: Continue to make regular flood control and drainage improvements as recommended by local agency plans, the U.S. Army Corps of Engineers, and the California Reclamation Board. These actions are independent of and in addition to the development review process.

HS.I-9: Work with the Solano County Water Agency (or successor agency) to review existing developments contributing to increased runoff and to reduce runoff wherever possible.

HS.I-15: Work with the Solano County Water Agency (or successor agency) in preparing a hydrological analysis of uplands, identifying the different watersheds that drain into the county, establishing flood-related objectives and priorities on a study area basis, and translating those into a coordinated series of flood-preventive measures for each watershed.

Yolo County General Plan

The following Yolo County General Plan goals, policies, and implementation actions are relevant to the proposed Project (County of Yolo 2009, pp. HS-17 to HS-18).

Goal HS-2 Flood Hazards. Protect the public and reduce damage to property from flood hazards.

Policy HS-2.1 Manage the development review process to protect people, structures, and personal property from unreasonable risk from flooding and flood hazards.

Policy HS-2.8 Consider and allow for the ecological benefits of flooding within historic watercourses while balancing public safety and the protection of property.

Implementation Programs (County of Yolo, 2009, p. HS-20)

Action HS-A13: Review development proposals to ensure that the need to maintain flood control capacity is balanced with consideration of the environmental health of watercourses that convey floodwaters so as not to cause significant erosion, sedimentation, water quality problems, or loss of habitat.

Action HS-A14: Require a minimum 50-foot setback for all permanent improvements from the toe of any flood control levee.

Action HS-A15: Restrict proposed land uses within 500 feet of the toe of any flood control levee, including but not limited to the items listed below, unless site-specific engineering evidence demonstrates an alternative action that would not jeopardize public health or safety:

- Prohibit permanent unlined excavations; […]
- Engineered specifications for levee penetrations; and
- Require landscape root barriers within 50 feet of the toe.

The Yolo County General Plan has established broad descriptions of buffers for areas within its county that are protected natural resource areas. These buffers protect riparian areas similar to the proposed Project. These buffers are explained in the General Plan policies and actions below.

Policy CO-1.15: Support efforts to acquire either fee title or easements on additional open space areas adjoining existing protected natural resource areas to increase the size, connectivity, and buffering of existing habitat. (County of Yolo 2009, p. CO-15)

Action CO-A27: Protect the habitat value and biological function of oak woodlands, grasslands, riparian areas, and wetland habitats. Avoid activities that remove or degrade these habitats and establish buffers to avoid encroachment into sensitive areas. (County of Yolo 2009, pp. CO-41 to CO-42)

Solano County Code (Ord. No. 865, Section 1; Ord. No. 1427, Section 1)

The following Solano County Code provisions are relevant to analysis of Hydrology and flood risks in the Project Area.

12.2-13 Methods of reducing flood losses.

In order to accomplish its purposes, this ordinance includes methods and provisions for:

(a) Restricting or prohibiting uses which are dangerous to health, safety, and property due to water hazards, or which result in damaging increases in flood heights or velocities;

(b) Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

(c) Controlling the alteration of natural floodplains, stream channels, and natural protective barriers which help accommodate or channel flood waters;

(d) Controlling filling, grading, dredging, and other development which may increase flood damage; and

(e) Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

Yolo County Code

The following Yolo County Code provisions are relevant to analysis of hydrology and flood risks in the Project Area.

Section 8-3.104: Methods of reducing flood losses.
In order to accomplish its purpose, this section includes methods and provisions to:

- Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
- Control filling, grading, dredging, and other development which may increase flood damage; and
- Prevent or regulate the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

Section 8-3.208: Development.

"Development" means any manmade change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, excavation or drilling operations, or storage of equipment or materials. For the purposes of this section, the following activities shall not be considered development:

- Typical agricultural activities, such as plowing, seeding, cultivating, harvesting, field leveling, contouring, and planting; and
- Residential and commercial landscape maintenance.

Section 8-3.209: Encroachment.

"Encroachment" means the advance or infringement of uses, plant growth, fill, excavation, buildings, permanent structures or development into a floodplain which may impede or alter the flow capacity of a floodplain.

Section 8-3.301: Lands to which this chapter applies.

This chapter shall apply to all areas of special flood hazards within the jurisdiction of Yolo County.

Section 8-3.302: Basis for establishing the areas of special flood hazard.

The areas of special flood hazard identified by the Federal Insurance Administration (FIA) of the Federal Emergency Management Agency (FEMA) in the Flood Insurance Study for Yolo County, dated April 2, 2002 (and all subsequent revisions) and accompanying Flood Insurance Rate Maps (FIRMs), dated December 16, 1980, and all subsequent amendments and/or revisions, are hereby adopted by reference and declared to be a part of this chapter. The flood Insurance Study and FIRMs are on filed at the Yolo County Community Development Agency, 292 West Beamer Street, Woodland, CA, 95695. This Flood Insurance Study and attendant mapping is the minimum area of applicability of this chapter and may be supplemented by studies for other areas which allow implementation of this chapter and which are recommended by the Floodplain Administrator and adopted by the Planning Commission.

Section 8-3.401: Establishment of flood hazard development permit.

A Flood Hazard Development Permit shall be obtained before any construction or other development begins within any area of special flood hazards established in Section 8-3.302. Application for a Flood Hazard Development Permit shall be made on forms furnished by the Floodplain Administrator and may include, but not be limited to: plans in duplicate drawn to scale showing the nature, location, dimensions, and elevation of the area in question; existing or proposed structures, fill, storage of materials, drainage facilities; and the location of the foregoing. Specifically, the following information is required:

(1) proposed elevation in relation to mean sea level, of the lowest floor (including basement) of all structures; in Zone AO elevation of highest adjacent grade and proposed elevation of lowest floor of all structures; or

(2) proposed elevation in relation to mean sea level to which any nonresidential structure will be floodproofed, if required in Section 8-3.501(c)(4); and

(3) all appropriate certifications listed in Section 8-3.403(d) of this chapter; and

(4) description of the extent to which any watercourse will be altered or relocated as a result of proposed development.

(5) in the A99 zone, base flood elevation and construction specifications shall be provided by a licensed engineer.

(6) all new proposed development (including proposals for manufactured home parks and subdivisions) greater than 50 lots of 5 acres, whichever is lesser, and located in areas of special flood hazards where base flood elevations have not been provided, shall include base flood elevation data prepared by a registered professional engineer.

In addition to the foregoing, the Floodplain Administrator may require such other information relevant to the Project as needed in order to enforce this chapter.

Other Requirements

Putah Creek Accord

On May 23, 2000, the Putah Creek Accord (Accord) between various parties from Solano County and Yolo County resulted from settlement of litigation between the Putah Creek Council (and other Yolo County-based parties), and the Solano County Water Agency, Solano Irrigation District, and other Solano County-based entities (EDAW, 2005, p. 5-31). The Accord set up a permanent dam release schedule based on the following goals:

(a) Flows for resident native fish, which include important spawning and rearing components and guarantee a continuous flow to the Yolo Bypass;

(b) Flows that will attract and support salmon and steelhead;

(c) A drought schedule that provides enough water to maintain Putah Creek as living stream but provides water users relief from other flow requirements;

(d) Creation of the Lower Putah Creek Coordinating Committee (LPCCC);

(e) Habitat restoration and monitoring funds for the creek; and

(f) A term requiring Solano County Water Agency to notify riparian water users of the amount of riparian water available in any given year and to prevent illegal water diversions in excess of the amount of riparian water available. (EDAW, 2005, p. 5-32)

The LPCCC promotes the adequacy of flows to protect fish and wildlife resources of Putah Creek and consists of representatives of Solano and Yolo counties with interests in the protection of Putah Creek resources. The LPCCC represents the Boards of Supervisors of Solano and Yolo counties; cities of Davis, Fairfield, Suisun, Vacaville, Vallejo, and Winters; Solano County Water Agency; Solano Irrigation District; Maine Prairie Water District; UC Davis; Putah Creek Council; and riparian landowners (EDAW, 2005, p. iii).

3.1.2 Significance Criteria

The following thresholds for measuring a project's environmental impacts are drawn from CEQA Guidelines Appendix G standards (OPR, 2013). An impact to surface hydrology or water quality is considered significant if implementation of the proposed Project will result in any of the following:

1. Substantially increase erosion or siltation on- or off-site.
2. Substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site.
3. Exceed the capacity of existing or planned stormwater drainage systems.

3.1.3 Impacts and Mitigation Measures

Impacts and mitigation measures are described below both generally and by reach. Applicable impacts and mitigation measures for each reach are summarized in **Table 3.1-3**, at the end of this section.

General Impacts and Mitigation Measures

Impact 3.1-1: Potential Erosion and/or Siltation Impacts.

Long-Term Impacts

The Project would not result in long-term adverse impacts to erosion or siltation because Project activities would have no effect on flow regimes that could affect erosion or siltation, and also because flow regimes and resulting velocities are controlled by Monticello Dam and regulated by the Putah Creek Accord, as discussed above. In addition, the Project would include a number of measures to reduce existing erosion problems.

Short-Term Impacts

Project activities could result in potential temporary impacts on erosion and siltation. The activities and effects are summarized below in **Table 3.1-2**, and are analyzed in further detail in below.

Project construction activities would not occur during the rainy season. In order to perform Project activities, occasional short-term diversions of low flows may be necessary to isolate the Project activity area from flowing water during the dry-season construction of channel improvements. However, this would be a portion of the creek; Project activities would not dewater the entire creek. These diversions would typically last no longer than two months and would be accomplished through installation of a temporary coffer dam, diverting stream flows along a portion of a reach either into a pipe, or trench side channel. In areas where the channel is braided, flow may be diverted from one channel to another to allow work in a neighboring segment.

These short-term diversions of flows to newly trenched channels could result in potential erosion and sedimentation impacts including localized minor scour, increased erosion, and localized release of upland sediment that could be deposited downstream. Based on prior restorations on the Creek, potential erosion and sedimentation effects would be most likely to occur during brief periods when establishing or removing the diversion structure, when sediments are released into the water column and a brief pulse of water that had been backed-up behind the dam is released into the newly created channel. These impacts would be minimized or avoided through regulatory compliance (CDFW Lake and Streambed Alteration Agreements, required for all Project activities, and Stormwater Pollution Prevention Plans [SWPPPs], required for Project activities disturbing more than 1 acre) and the application of Mitigation Measure 3.1-1, described below.

Channel reconfiguration activities proposed for the Project, such as construction grading and clearing, could create short-term adverse erosion and siltation impacts to the stream channel by grading and scarifying soil in the active stream channel to create the new channel features.

Table 3.1-2 Summary of Erosion Effects of Project Activities

Project Activity or Action	Effect	Impact Significance
Narrow low-flow channel	Short term: Minor increases in erosion until channel is stabilized. Long term: Potential minor increase in lateral erosion from the average water elevation and velocity	No impact.
Increase creek substrate roughness	Short term: Minor increase in erosion post-construction Long term: Reduce flow velocity from operations	Less than significant.
Temporary flow diversion (pipe, trench, or temporary coffer dam)	Short term: Erosion and siltation from construction	Avoided/reduced to insignificance through regulatory compliance and Measure 3.1-1.
Channel reconfiguration (grading and clearing)	Short term: Erosion and siltation from construction	Avoided/reduced to insignificance through regulatory compliance and Measure 3.1-1.
Construction of access ramps	Short term: Erosion and siltation from construction	Avoided/reduced to insignificance through regulatory compliance and Measure 3.1-1.
Gravel augmentation, scarification, and maintenance	Short term: Erosion and siltation until scarified sediments stabilize; possible short-term impacts during maintenance	Less than significant: limited number of acres per year, activity and impact lasting only a few minutes, de minimus impact.
Project maintenance activities such as weed management	Short term erosion and siltation until revegetation occurs	Avoided/reduced to insignificance through regulatory compliance and Measure 3.1-1.

Construction of ramps for access to the creek also could create short-term adverse erosion and siltation impacts to the stream channel. These impacts would be minimized or avoided through regulatory compliance required for all Project activities, Stormwater Pollution Prevention Plans [SWPPPs] (required for Project activities disturbing more than one acre), and the application of Mitigation Measure 3.1-1. These would require stabilized ramps constructed to minimize erosion and sediment deposition in creek waters.

As described in Chapter 2, *Project Description*, irrigation is expected to be used for up to 3 years at revegetated sites to establish native plantings. Different irrigation methods may be used depending on the site, but all irrigation components would be above-ground and temporary. This could result in short-term erosion impacts, but these potential impacts would be minimized or avoided through regulatory compliance

required for all Project activities, Stormwater Pollution Prevention Plans [SWPPPs] (required for Project activities disturbing more than one acre), and the application of Mitigation Measure 3.1-1.

Short-term erosion or siltation could occur due to Project maintenance activities such as weed management that may expose soils in the channel banks and bottom. However, the CDFW Lake and Streambed Alteration Agreements that would be required for all Project activities would forbid leaving bare ground and would require revegetation of exposed soils, as well as soil stabilization until new vegetation becomes established. Storm Water Pollution Prevention Plans (SWPPPs) required for the Project would also require revegetation before closure of Project work sites. Additionally, for Project activities that that disturb less than one acre of soil, Mitigation Measure 3.1-1 would require the application of SWPPP-type Best Management Practices (BMPs) to avoid leaving exposed ground and prevent erosion. (For example, under Mitigation Measure 3.1-1 below, see BMPs EC-2 Preservation of Existing Vegetation, EC-4 Hydroseeding, and SE-5 Fiber Rolls.)

Gravel augmentation and scarification activities could contribute to erosion or siltation by leading to short-term fine sediment pulses. The gravel augmentation would occurring in a limited number of locations in the creek each year (61 riffles per year, with a maximum of about 10,000 cubic yards of gravel) for very brief periods and would release substantially less sediment than occurs under existing conditions of creek bank failures. Some minor internal channel movement which results in erosion and re-deposition of channel materials is part of the healthy function of the creek, and therefore this is not considered a significant adverse impact.

Short-term erosion or siltation impacts would be further minimized through regulatory compliance and the application of Mitigation Measure 3.1-1. Project activities would be subject to CWA Section 401 Water Quality Certification for discharges of dredged and fill materials through the CVRWQCB (SWRCB, 2014). As part of this certification, CVRWQCB would require erosion controls in all areas disturbed by Project activities, as is discussed in further detail in Section 3.2, *Water Quality,* of this EIR. These regulatory controls would ensure that the Project's erosion and siltation impacts would be less than significant.

SWPPPs would be required for Project activities that disturb one or more acres of soil under the National Pollution Discharge Elimination System (NPDES) General Permit for Construction Storm Water Discharges. The SWPPPs would also incorporate visual,

chemical, and sediment monitoring programs as required. See Section 3.2, *Water Quality,* for additional detail on SWPPP requirements.

A SWPPP may not be required for certain Project activities, such as activities that disturb less than one acre of soil. In those situations, Mitigation Measure 3.1-1 would ensure that Project impacts remain less than significant by implementing BMPs designed to avoid or minimize adverse impacts associated with erosion and siltation.

Mitigation Measure 3.1-1: Implement Erosion and Sediment Control BMPs.

In the cases in which a SWPPP is not required for Project activities, the Project applicant shall implement BMPs selected by a Qualified SWPPP Developer. The BMPs shall be drawn from the Construction BMP Handbook published by the California Stormwater Quality Association (CASQA) or equivalent prior to the start of any ground-disturbing activities. These BMPs may include, but are not restricted to, the menu of measures listed below, and would be applied both during and after construction, until the work site is stabilized according to the same closure requirements that would be applicable were the work area subject to a SWPPP.

In order to ensure that the BMPs implemented are functioning to prevent erosion and sediment impacts, a California-qualified Qualified SWPPP Practitioner (QSP) must inspect functioning of the BMPs on a weekly basis. If the BMPs are insufficient, the QSP shall make recommendations for additional or sufficient BMPs.

Erosion Controls – Menu of Potential BMPs

- Stream Bank and Channel Stabilization: Where creek banks and channels are disturbed by construction, application of the full suite of available BMPs shall be coordinated by the QSP for application during and following construction to reduce the discharge of sediment and other pollutants from stream banks to minimize the impact of construction activities (CASQA, 2009, Fact Sheet EC-12).
- Scheduling: The QSP shall prepare a written plan to sequence construction activities and the implementation of other BMPs to reduce the amount and duration of soil exposed to erosion by wind, rain, runoff, and vehicle tracking. Environmental constraints such as nesting season prohibitions shall also be taken into account in developing a schedule (CASQA, 2009a, Fact Sheet EC-1).
- Preservation of Existing Vegetation: Where possible, existing non-invasive and native vegetation shall be preserved to minimize the potential of removing or injuring

existing trees, vines, shrubs, and grasses that protect soil from erosion (CASQA, 2009, Fact Sheet EC-2).

- Hydroseeding: Where soil has been disturbed by construction and requires temporary protection until permanent stabilization is established, a mixture of hydraulic mulch, seed, fertilizer, and stabilizing emulsion shall be applied to temporarily protect exposed soils from erosion by water and wind (CASQA, 2009, Fact Sheet EC-4).
- Geotextiles and Mats: Where soil has been disturbed by construction on slopes where the erosion hazard is high and vegetation will be slow to establish, mattings shall be used to cover the soil surface to reduce erosion from rainfall, hold soil in place, and absorb and hold moisture near the soil surface (CASQA, 2009, Fact Sheet EC-7).
- Wood Mulching: Where soil has been disturbed by construction and temporary protection is needed until permanent stabilization is established, an applied mixture of shredded wood mulch, bark, or compost shall be applied to disturbed soils to reduce erosion by protecting bare soil from rainfall. This BMP shall not be used on areas exposed to concentrated flows or on slopes steeper than 3:1 (H:V) (CASQA, 2009, Fact Sheet EC-8).
- Velocity Dissipation Devices: Where needed, a physical device composed of rock, grouted riprap, or concrete rubble, shall be placed at the outlet of a pipe or channel to prevent scour of the soil caused by concentrated high velocity flows. This BMP will be applied to stormwater structures as needed to divert run-on flow during construction (CASQA, 2009, Fact Sheet EC-10).

Sediment Controls– Menu of Potential BMPs

- Silt Fence: Where needed, a woven geotextile that has been entrenched, attached to supporting poles, and sometimes backed by a plastic or wire mesh for support will be installed temporarily to detain sediment-laden water and promote sedimentation behind the fence. This shall be used in areas disturbed by construction as a perimeter control, above channels, and/or below the toe or downslope of exposed and erodible slopes (CASQA, 2009, Fact Sheet SE-1).
- Fiber Rolls: Where needed, fiber rolls shall be placed at the toe and on the face of slopes along the contours to intercept runoff, reduce its flow velocity, release the runoff as sheet flow, and provide removal of sediment from the runoff (CASQA, 2009, Fact Sheet SE-5).

- Gravel Bag Berm: Where needed, a series of gravel-filled bags shall be placed on a level contour to intercept sheet flow runoff, allow sediment to settle out, and release runoff slowly as sheet flow, preventing erosion (CASQA, 2009, Fact Sheet SE-6).
- Straw Bale Barrier: Where needed, a series of straw bales shall be placed on a level contour to intercept sheet-flow runoff and allow sediment to settle out (CASQA, 2009h).
- Compost Sock and Berm: Where needed, a three-dimensional biodegradable filtering structure shall be used at the site perimeter or at intervals on sloped areas to intercept runoff where sheet flow occurs to retain sediment (CASQA, 2009, Fact Sheet SE-13).
- Stabilized Construction Entrance and Exit: A pad of aggregate underlain with filter cloth shall be constructed at a point where traffic would be entering or leaving a construction site to or from a public right of way, street, alley, sidewalk, or parking area. The purpose of a stabilized construction entrance is to reduce or eliminate the tracking of sediment onto roadways and help prevent deposition of sediments into local storm drains and production of airborne dust (CASQA, 2009i).
- Stabilized Construction Roadway: Access roads and parking areas shall be stabilized immediately after any grading and maintained to prevent erosion and control dust after grading (CASQA, 2009, Fact Sheet TC-2).

Non-Stormwater Controls

- Temporary Stream Crossing: Where needed, a temporary culvert, ford, or bridge shall be placed across a waterway to provide access for construction purposes for a period of less than 1 year. These crossings are intended to eliminate erosion and downstream sedimentation caused by vehicles (CASQA, 2009, Fact Sheet NS-4).

Erosion and sediment controls implemented to comply with Federal Clean Water Act Section 401 Water Quality Certification, with any required SWPPP(s), and with Mitigation Measure 3.1-1 would ensure that Project impacts from erosion and siltation to the environment would remain **less than significant**. No additional mitigation is required.

Impact 3.1-2: Stream Diversion During Construction.

The Project would change flows in existing stream channels during and after construction. During construction, flows would be diverted in all reaches where channel

reconstruction work is proposed in the existing channel. This diversion may be into temporary excavated bypass channels, existing braided channel segments not proposed for reconstruction, or pipes bypassing the construction areas. During these periods, the existing stream channel would be dewatered for a period of weeks or months. In the long term, flows would either resume in the existing channel areas (reconstructed) or through new channels. Although portions of the existing stream channel would be dewatered during construction, this is not considered a significant impact on hydrology because flows would either be directed into other channels or, if bypass flows are piped, the piped areas would be limited in length, temporary and short-term in duration, and reconnected to upstream and downstream channels when channel work is completed in the reach or sub-reach. The impact would be less than significant.

Impact 3.1-3: Potential Changes to Flood Hazards.

The Project would narrow the low-flow channel. Such narrowing within the entrenched floodplain may cause minor increases in the average water elevation and velocity, but these minor elevations (a matter of a few inches) would not lead to greater out-of-bank flooding. The increased velocity would also increase the transport of coarser sediments downstream, a Project purpose. Thus, this particular type of erosion would be a Project benefit, not a negative impact. In addition, the Project aims to increase sinuosity of the creek, which increases overall channel length, effectively slowing the flow velocity and bringing the channel into “equilibrium”.

The Project could result in minor increases to creek substrate roughness¸ also effectively reducing velocity compared to existing conditions. Reduction of velocity has the potential to nominally raise flood elevations. However, this nominal raising of flood elevations would not result in any adverse environmental impacts for several reasons: first, the overall capacity of the channel would remain the same; second, the creek is well-entrenched throughout most of its length, and leveed through the remainder, which tends to confine water to the creek channel both under existing conditions and under projected Project and post-Project conditions; and lastly, invasive riparian vegetation is very rough hydraulically, but the Project is removing these dense thickets and replacing them with much less rough native species.

The Project would have no effect on flow volumes in the creek because flows are controlled by Monticello Dam and regulated by the Putah Creek Accord, as discussed above under Environmental Setting. Therefore the Project would not increase flooding risks or areas of flooding on- or off-site.

Therefore, the Project would have **no impact** on flooding on- or off-site. No mitigation is required.

Impact 3.1-4: Impacts to Existing Stormwater Drainage Systems.

Within the Project Area, occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. If modifications or replacement of these drainage systems were not performed according to current standards, they could be damaged or perform less efficiently or in a substandard manner. Implementation of Mitigation Measure 3.1-2 below would reduce impacts related to stormwater drainage systems to a **less-than-significant** level.

Mitigation Measure 3.1-2: Standards for Modification or Replacement of Storm Drains.

In the event roadway or agricultural storm drains need to be modified or replaced as a result of the channel alignment or other Project activities, such modification or replacement will be done in a manner to bring the drain(s) up to current standards. The Project would replace or upgrade the facility to applicable standards in consultation with property owner. Depending on the funding source or location for a given Project activity, the improvements would be conducted be under city, county, state, or federal standards. For drains in Solano County, the Project would rely on the Solano County Public Works specifications. For portions of the Project occurring exclusively within Yolo County (Mace Road to Road 106A Reach and Road 106A to the YBWA) replacement drains would rely on the Yolo County Public Works specifications.

In the event that roadway or agricultural storm drains within flood levees need to be modified or replaced as a result of Project activities, such modification or replacement shall be performed in strict consultation with the Central Valley Flood Protection Board (CVFPB) and according to CVFPB standards and requirements.

Site-Specific Impacts and Mitigation Measures

NAWCA/Mariani

<u>Erosion/Siltation</u>

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be

significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measures 3.1-2 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

Duncan-Giovannoni

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level. No additional mitigation is necessary.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measure 3.1-2 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

Winters Putah Creek Nature Park

Erosion/Siltation

Except for a small portion of the reach far upstream, restoration activities have already been completed for this reach, so the only activities anticipated in this reach are maintenance, including weed control. The only potential erosion and siltation impacts resulting from the Project could be from mechanical weed-pulling or the inadvertent over-application of herbicide, in the event either of these activities disturbed and exposed soil that could run into the creek. However, the completed restoration project in this area achieved a low gradient floodplain by design, and so there is no mechanism by which unintended sediment could be released. Thus, the proposed Project would have **no impact** related to erosion or siltation. No mitigation is required in this reach.

Flooding

The only Project activities anticipated in this reach are maintenance activities, except for a far upstream portion of the reach. Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The Project would have **no impact** on flood risk related to alterations of the existing drainage pattern.

Stormwater Drainage Systems Impacts

Several municipal drains for the City of Winters are located in this reach, but because restoration activities have already been completed for this reach, proposed Project activities would only involve maintenance and would not alter stormwater drainage systems. In the far upstream portion of the reach, a large municipal drain is located in an area that may be subject to some Project construction activities. However, any

activities will be performed in a manner to avoid any impacts to the drain, which is a 4-foot diameter concrete pipe with a concrete splashway that would not be practical to modify or relocate. Therefore, there would be **no impact** on stormwater drainage systems and no mitigation is required.

East of 505

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level. No additional mitigation is necessary.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measure 3.1-2 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

Warren

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

A Yolo County Flood Canal return outfall is located in this reach, but will not be moved or affected by the Project. Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measure 3.1-2 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

Upper McNamara

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be

significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measure 3.1-2 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

Lower McNamara

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measure 3.1-2 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

MacQuiddy (Lester)

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measure 3.1-2 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

Russell Ranch

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measure 3.1-2 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

Stevenson Bridge

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow

diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measure 3.1-2 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

Glide Ranch

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measure 3.1-2 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

Nishikawa

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measure 3.1-2 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

Olmo-Hammond-UCD

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level. No additional mitigation is necessary.

Flooding

Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The proposed Project would have no effect on surface runoff because it would not affect flows or overall channel capacity in this reach. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

Western Portion of Reach

Occasional small roadway or agricultural storm drains may need to be modified or replaced as a result of the channel alignment. Mitigation Measure 3.1-3 would reduce any potential impacts to stormwater drainage systems to a **less-than-significant** level.

Eastern Portion of Reach

This portion of the reach is within the leveed channel. Any structures that penetrate the levee would require consultation with the CVFPB. It is not expected that these

structures would be modified, but if so, Mitigation Measure 3.1-3 would be applied, and such work would be performed in strict consultation with the CVFPB to ensure that impacts related to stormwater drainage systems would be **less than significant**.

I-80 to Old Davis Road

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level. No additional mitigation is necessary.

Flooding

This reach is located in a portion of the creek that is leveed and is less entrenched, but because Project activities in this reach would not substantially alter the amount of water passing through the creek, or channel capacity, it would not increase flooding risks on- or off-site. The Project would have **no impact** on flood risk.

Stormwater Drainage Systems Impacts

Any structures that penetrate the levee would require consultation with the CVFPB. It is not expected that these structures would be modified, but if so, Mitigation Measure 3.1-2 would be applied, and such work would be performed in strict consultation with the CVFPB to ensure that impacts related to stormwater drainage systems remain **less than significant**.

Old Davis Road to Mace

Approximately the first one-quarter of this reach has undergone some restoration activities other than maintenance. Restoration activities have not been performed on the remainder of the reach.

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level.

Flooding

As with the I-80 to Old Davis Road reach, this reach is located in a portion of the creek that is leveed and is less entrenched, but because Project activities in this reach would not alter the amount of water passing through the creek, or channel capacity, it would not increase flooding risks on- or off-site. The Project would have **no impact** on flood risk.

Stormwater Drainage Systems Impacts

This is a leveed reach. Any structures that penetrate the levee would require consultation with the CVFPB. It is not expected that these structures would be modified, but if so, Mitigation Measure 3.1-2 would be applied, and such work would be performed in strict consultation with the CVFPB to ensure that impacts related to stormwater drainage systems would be **less than significant**.

Mace to Road 106A

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented

to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level.

Flooding

This reach is located within the floodplain of the Yolo Bypass and so is subject to flooding both inside and outside of the levee. Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or otherwise increase flooding risks on- or off-site. The Project would have **no impact** on flood risk.

Stormwater Drainage Systems Impacts

This is a leveed reach. Any structures that penetrate the levee would require consultation with the CVFPB. It is not expected that these structures would be modified, but if so, Mitigation Measure 3.1-2 would be applied, and such work would be performed in strict consultation with the CVFPB to ensure that impacts related to stormwater drainage systems would be **less than significant**.

Road 106A to Yolo Bypass Wildlife Area

Erosion/Siltation

As described in Impact 3.1-1, above, potential short-term erosion and/or siltation impacts could result from Project construction activities such as temporary flow diversions; channel reconfiguration (including grading and clearing); gravel augmentation, scarification, and maintenance; and from Project maintenance activities such as weed management. Long-term erosion and siltation impacts would not be significant because Project work sites would have stabilized before long-term impacts could occur. As identified in Impact 3.1-1, erosion and sediment controls implemented to comply with Section 401 Water Quality Certification and any required SWPPP(s) would ensure that short-term construction-related Project erosion and siltation impacts would be **less than significant**. In the event a SWPPP is not required for Project activities, Mitigation Measure 3.1-1 would reduce any potential construction related erosion and siltation impacts to a **less-than-significant** level. No additional mitigation is necessary.

Runoff and Flooding

Like the Mace to Road 106A reach, this reach is located within the floodplain of the Yolo Bypass and so is subject to flooding both inside and outside of the levee. Project activities in this reach would not substantially alter the amount of water passing through the creek, channel capacity, or increase flooding risks on- or off-site above the current level. The Project would have **no impact** on flood risk in this reach.

Stormwater Drainage Systems Impacts

This is a leveed reach. Any structures that penetrate the levee would require consultation with the CVFPB. It is not expected that these structures would be modified, but if so, Mitigation Measure 3.1-2 would be applied, and such work would be performed in strict consultation with the CVFPB to ensure that impacts related to stormwater drainage systems would be **less than significant**.

Table 3.1-3 Summary of Hydrology Impacts and Mitigation Measures

Reach	Impact 3.1-1 Erosion or Siltation Impacts	Impact 3.1-2 Stream diversion during construction	Impact 3.1-3 Runoff and Flooding	Impact 3.1-4 Stormwater Drainage Systems	Applicable Mitigation Measures
NAWCA/Mariani	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Duncan-Giovannoni	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Winters Putah Creek Nature Park	NI	NI	NI	NI	none
East of 505	NI	LS	NI	NI	MM 3.1-1 MM 3.1-2
Warren	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Upper McNamara	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Lower McNamara	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
MacQuiddy (Lester)	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Russell Ranch	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Stevenson Bridge	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Glide Ranch	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Nishikawa	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Olmo-Hammond-UCD	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
I-80 to Old Davis Road	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Old Davis Road to Mace	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Mace to Road 106A	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2
Road106A to YBWA	SM	LS	NI	SM	MM 3.1-1 MM 3.1-2

Notes: NI = no impact, LS = LTS = Less than Significant Impact, SM = Significant but mitigatable to less than significant with measures identified in this section, and SU = Significant and Unavoidable, even after mitigation.