3.3 Hydrology and Water Quality

3.3.1 Introduction

This section analyzes the proposed project's potential impacts related to hydrology and water quality. It describes existing conditions in the study area and summarizes the overall Federal, state, and local regulatory framework for hydrology and water quality, and it analyzes the potential for the proposed project to affect these resources.

3.3.2 Existing Conditions

This section defines the study area for hydrology and water quality and discusses the existing conditions in the study area.

The study area is approximately 8 miles of the Feather River starting upstream of the project area (i.e., OWA D-Unit) inlet weir (River Mile [RM] 59.5) to approximately 0.5 mile downstream of the dredge tailings (RM 52.7). The study area is larger in aerial coverage than the project area, and includes the bed and banks of the Feather River upstream and downstream of the project area as well as the area affected by construction (i.e., the construction footprint) and the changes in inundation (Figure 2-1).

3.3.2.1 Regional Setting

The proposed project is within the Sacramento River Hydrologic Region, which encompasses an area of approximately 17.4 million acres (27,200 square miles) and contains all or large portions of Modoc, Siskiyou, Lassen, Shasta, Tehama, Glenn, Plumas, Butte, Colusa, Sutter, Yuba, Sierra, Nevada, Placer, Sacramento, El Dorado, Yolo, Solano, Lake, and Napa Counties (California Department of Water Resources 2003a:158). Most of northern California is located in the Sacramento River Hydrologic Region, which encompasses several watersheds of varying size. According to the U.S. Geological Survey (USGS), the study area is within the Lower Feather Watershed (USGS Hydrologic Unit Code #18020106) (U.S. Geological Survey 1978).

Surface Water Hydrology

The lower Feather River originates at the Oroville Dam and meanders south to its confluence with the Sacramento River near Verona; it drains the western slope of the Sierra Nevada Mountains and the Sutter Buttes. The Lower Feather River Watershed consists of approximately 788 square miles or about 13% of the entire Feather River drainage (Foothill Associates 2010:27). The Lower Feather River Watershed is entirely contained by a series of levees and native high ground.

Flows from the Feather River are captured, stored, and diverted for hydroelectric power production, irrigation, flood control, domestic water supply, and recreation (Foothill Associates 2010:27). The Lower Feather River Watershed is one of the most hydrologically-modified river basins in California largely due to releases from the Oroville Dam. Water is released from the Oroville Dam as part of a coordinated effort to meet water supply, flood protection, water quality improvement, and fish and wildlife enhancement requirements. Lake Oroville is owned and operated by California Department of Water Resources (DWR), and is the largest reservoir in the State Water Project (SWP) with a

capacity of 3.5 million acre-feet. Built in 1968, the Oroville Dam is located on the Feather River, 4 miles northeast of the City of Oroville.

The Oroville Dam is used as a peak operating power facility[1] in conjunction with the Thermalito Facilities; this system of facilities is known as the Oroville-Thermalito Complex. Water released from Lake Oroville is used to produce electricity by the Hyatt Pumping-Generating Plant. Because of power operations, releases are made on a peaking basis of up to 16,950 cubic feet per second (cfs) when power is in high demand (on-peak) with little or no release the remainder of the day (off-peak). The water that flows through the Hyatt Pumping-Generating Plant is discharged into the Thermalito Diversion Pool, where the flows are diverted into the Thermalito Forebay, the Feather River Fish Hatchery, or the Low Flow Channel. From the Thermalito Forebay, flows can be diverted into either several canals or released through the Thermalito Pumping-Generating Plant to the Thermalito Afterbay. From the Thermalito Afterbay, flows can be diverted into several canals or released to the Feather River.

Flow Frequency

The hydrologic regime of the Lower Feather River has been significantly altered since the completion of Oroville Dam in 1968. There are two hydrologically distinct sections within the study area. The reach upstream of the Thermalito Afterbay outflow at RM 58.5 is considered the low flow reach dictated by water released from the Fish Barrier Dam (RM 66.5). Minimum flows of at least 600 cfs are maintained to achieve favorable fish habitat conditions in the low flow reach between RM 58.5–RM 66.5 (DWR 2004a as cited in cbec 2015:3). Thermalito Afterbay outflows generally meet an instream flow requirement of 1,700 cfs from October through March and 1,000 cfs from April through September (DWR 2004a as cited in cbec 2015:3) (Appendix 3.3-A).

Mean annual flow calculations for USGS stations along the Feather River between Oroville and Yuba City are presented in Table 3.3-1.

Table 3.3-1. Mean Annual Flow Calculations for the Feather River, Oroville to Yuba City

USGS Station #	USGS Station Name	Drainage Area	Mean Annual Flow (cfs)	Basis (WY–WY)
11407000	Feather River at Oroville	3,624	1,076	1969–2014
11406920	Thermalito Afterbay release to Feather River	–	3,498	1969–2014
	Feather River above Yuba City sub-total		4,574	

Source: U.S. Geological Survey 2016
USGS = U.S. Geological Survey
cfs = cubic feet per second
WY = water year

Surface Water Quality

Water quality in the Lower Feather River Watershed is primarily influenced by agricultural and urban runoff but is also affected by municipal water use in surrounding areas. Contaminants from urban runoff can vary depending on rainfall intensity and occurrence, geographic features, land use,

[1] During normal operation, a 24-hour supply of water flows through both plants during a peak 6–10 hour window of the day when power production is most needed.

vehicular traffic, and percent of impervious surface (Sacramento River Watershed Program 2010). During the dry period in the watershed area (May–October), pollutants from various sources—such as vehicles; residential, industrial, and agricultural land uses; and atmospheric fallout—accumulate on the land surrounding water bodies. These contaminants can be mobilized from stormwater runoff during the wet season (November–April). The initial runoff, known as the *first flush*, typically contains peak pollutant levels.

Water quality dynamics also have been influenced by the operation of flow-regulating facilities within and around the watershed area. Variations in some water quality parameters may be correlated with fluctuations in flow throughout the year. The storage and diversion of water for hydroelectric and other purposes can affect downstream beneficial uses by altering water temperature and turbidity. Turbidity and sediment levels spike during heavy storm runoff in the winter and spring. In the spring and early summer, water quality is primarily affected by agricultural drainage and natural runoff. During periods of low flows, specifically the late summer–early fall, water quality decreases due to high water temperatures and pollutant concentrations.

The Basin Plan (Central Valley Regional Water Quality Control Board 2011) describes beneficial uses for the Feather River (Table 3.3-2). Section 303(d) of the Federal Clean Water Act (CWA) established the total maximum daily load (TMDL) process to assist in guiding the application of state water quality standards. Section 303(d) requires states to identify streams in which water quality is impaired (i.e., affected by the presence of pollutants or contaminants) and to establish the TMDL, which is the maximum quantity of a particular contaminant that a water body can assimilate without experiencing adverse effects. Table 3.3-3 shows CWA 303(d) listed impairments for the Feather River based on the 2010 California Integrated Report (California State Water Resources Control Board 2011).

Table 3.3-2. Designated Beneficial Uses for Surface Water Bodies in the Project Vicinity

Water Body	Designated Beneficial Uses
Feather River (Fish barrier dam to Sacramento River)	Municipal and domestic supply; irrigation; stock watering; water contact recreation; non-contact water recreation; warm and cold freshwater habitat; warm and cold fish migration; warm and cold fish spawning; wildlife habitat.

Source: Central Valley Regional Water Quality Control Board 2011 (Table II-1)

Table 3.3-3. CWA 303(d) Listed Impaired Waters with Potential to be Affected by the Proposed Project

Water Body	Pollutant Stressors	Potential Sources	TMDL Completion Date
Feather River, Lower (Lake Oroville Dam to Confluence with Sacramento River)	Chlorpyrifos	Agriculture	Est. 2019
	Group A pesticides	Agriculture	Est. 2011
	Mercury	Resource extraction	Est. 2012
	PCBs	Unknown	Est. 2021
	Unknown toxicity	Unknown	Est. 2019

Source: 2010 Integrated Report (State Water Resources Control Board 2011)
PCBs = polychlorinated biphenyls

Groundwater Hydrology

DWR delineates groundwater basins throughout California under the State's Groundwater Bulletin 118. The proposed project is located in the Sacramento Valley Groundwater Basin, East Butte Subbasin (Basin No. 5-21.59). The East Butte Subbasin has a total surface area of 265,390 acres (314 square miles). It is bounded on the west and northwest by Butte Creek, on the northeast by the Cascade Ranges, on the southeast by the Feather River, and the south by the Sutter Buttes.

In the portion of the subbasin located within the southern part of Butte County, groundwater level fluctuations for composite wells average approximately 4 feet during normal years and up to 10 feet during drought years. The groundwater fluctuations for wells constructed in the confined and semiconfined aquifer system average 4 feet during normal years and up to 5 feet during drought years. DWR calculated groundwater storage capacity in the subbasin at 3,128,959 acre-feet to a depth of 200 feet on the basis of available information (California Department of Water Resources 2003b:3).

Groundwater Quality

Groundwater quality in the East Butte Subbasin is characterized as a calcium-magnesium bicarbonate and magnesium-calcium bicarbonate type (California Department of Water Resources 2003b:4). Total dissolved solids (TDS) values range from 122 to 570 milligrams per liter (mg/L), averaging 235 mg/L. Impairments include high concentrations of manganese, iron, magnesium, TDS, conductivity, adjusted sodium adsorption ratio, and calcium (California Department of Water Resources 2003b:4).

3.3.2.2 Local Conditions

Climate

The climate of the study area is characterized by hot, dry summers with highs in the upper 90s (°F) and lows in the low 60s, and cool, wet winters with highs in the mid-50s and lows in the upper 20s. Precipitation in the study area occurs mostly as rain, and yearly totals average approximately 18 inches (Burkett and Conlin 2006:9). Approximately 95% of the annual rainfall occurs between October and April (U.S. Army Corps of Engineers 2004:2-2). Precipitation increases with elevation. In the upper Feather River Basin near Lassen Peak, as many as 90 inches of precipitation falling annually (U.S. Army Corps of Engineers 2004:2-2).

Surface Water Hydrology

The study area is characterized by a highly disturbed floodplain that has been hydrologically disconnected from the Feather River by gold dredging and borrow pit excavation during construction of the Oroville Dam. The study area is disconnected from the Feather River during times of low flow by a 15-feet-high to 20-feet-high berm along its northeast boundary that is adjacent to river. When flow is greater than approximately 43,000 cfs, water flows into and out of the study area through a system of inflow and outflow weirs (Peterson Brustad 2015). Stormwater runoff also enters the D-Unit area from the east. The existing weir system includes one 600-feet inflow gabion weir and one 550-feet sheet pile wall outflow weir. There is also an existing low flow outlet and culvert located at the southwest corner of the project area. As the stage (i.e., water surface level) in the Feather River increases, both the outflow weir and the low flow outlet allow water to

enter the project area prior to water spilling over the inflow weir[2]. The project area contains a network of interior channels and disconnected ponds. The bottoms of these channels and ponds are, in many places, lower in elevation than the Feather River. Historical aerial photographs indicate that the major interior channels were in place after the construction of Oroville Dam. Since the dam construction, the main channel features have remained largely unchanged. (Peterson Brustad 2015:6, 9.)

Surface and Ground Water Quality

Although high levels of mercury in the lower Feather River have been attributed to dredge tailings in the Feather River Watershed, the relative proportion of mercury derived from the study area has not been documented. The overall size of the project area dredge tailings that are exposed to river flow is relatively small compared to that of the two main tributaries in the greater watershed (i.e., the Yuba and Bear Rivers), therefore it is plausible that the proportion of the study area's contribution to mercury loads is small relative to these tributaries (Appendix 3.3-A). (cbec 2015:3.)

There is also a historic burn dump in the northeast portion of the study area. Due to historic practices, the study area is a Recognized Environmental Condition (REC). A REC is defined as the "presence or likely presence of any hazardous substances or petroleum under conditions that indicate an existing release, a past release, or a material threat of a release into the ground, groundwater or surface water of the property above de minimis conditions". Lead concentrations exceeded the California limits for Total Threshold Limit Concentration and the Soluble Threshold Limit Concentration (STLC). Copper concentrations exceeded the STLC. Exceeding these concentrations means that waste removed from the study area may be classified in California as hazardous. (HDR 2014.) Other surface and ground water quality stressors within the study area are the influx of warm water from Thermalito Afterbay releases, the dominance of aquatic invasive plants in the ponds and channels within the project area levees, and the isolation of the historic floodplain from the Feather River.

Groundwater Hydrology

Aquifers in the vicinity of the study area consist of discontinuous lenses of gravel, sand, silt, and clay derived from the Sierra Nevada and Coast Ranges. Several groundwater studies have demonstrated that groundwater hydrology is extremely variable in the study area. As reported by DWR, groundwater is as shallow as 5 feet below ground surface in the vicinity of the study area. Recent studies by DWR show that water level data from the adjacent ponds within the study area have a direct hydraulic correlation (subsurface/hyporheic) with Feather River levels. (DWR 2004b as cited in Peterson Brustad 2015:9.)

3.3.3 Regulatory Setting

Refer to Chapter 3.2, *Flood Control and Geomorphic Conditions*, for additional regulatory setting information that is applicable to hydrology and water quality.

[2] The original weir design intended to divert approximately 80,000 cfs from the main channel into the project area during the peak of the 200-year event to reduce peak stages downstream through attenuation. However, analysis has indicated that the current weir configuration only diverts approximately 40,000 cfs during the peak of the 200-year event (SBFCA 2013 as cited in cbec 2015).

3.3.3.1 Federal

Clean Water Act

The CWA is the primary Federal law that protects the quality of the nation's surface waters, including lakes, rivers, and coastal wetlands. It operates on the principle that all discharges into the nation's waters are unlawful unless specifically authorized by a permit. Permit review is the CWA's primary regulatory tool under the following sections.

- Section 404, which regulates the discharge of dredged and fill materials into "waters of the United States," which include oceans, bays, rivers, streams, lakes, ponds, and wetlands. Project proponents must obtain a permit from USACE for all discharges of dredged or fill material into waters of the United States before proceeding with a proposed activity. The Feather River and other features in the project area may be jurisdictional waters of the Unites States and subject to Section 404.
- Section 402, regulates discharges to surface waters through the National Pollutant Discharge Elimination System (NPDES) program, administered by U.S. Environmental Protection Agency (EPA). In California, the State Water Resources Control Board (State Water Board) is authorized by EPA to oversee the NPDES program through the Regional Water Quality Control Boards (RWQCBs). The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits. A stormwater pollution prevention program (SWPPP) and pollution prevention and monitoring program (PPMP) may be required for construction of the project to comply with the Construction General Permit and General Dewatering Permit, respectively, under Section 402.
- Section 401, under which applicants for a Federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification from the state in which the discharge would originate. In this case, the RWQCB must issue a certification to USACE or their applicant for USACE Section 404 action.
- Section 303, under which California adopts water quality standards to protect beneficial uses of state waters as required by CWA Section 303 and the Porter-Cologne Water Quality Control Act of 1969. Section 303(d) of the CWA requires the identification of water bodies that do not meet, or are not expected to meet, water quality standards (i.e., impaired water bodies). In California, the State Water Board develops the list of water quality-limited segments and the EPA approves the state's list.

The State Water Resources Control Board (State Water Board) is the State agency with primary responsibility for implementing the CWA, which establishes regulations relating to water resources issues. Typically, all regulatory requirements are implemented by the State Water Board through nine RWQCBs established throughout the state. The Central Valley RWQCB, discussed in the state regulatory setting below, is responsible for regulating discharges to the Feather River and its tributaries.

3.3.3.2 State

Porter-Cologne Water Quality Control Act of 1969

The Porter-Cologne Water Quality Control Act established the State Water Board and nine Regional Water Boards as the primary state agencies with regulatory authority over California water quality

and appropriative surface water rights allocations. Under this act (and the CWA), the state is required to adopt a water quality control policy and waste discharge requirements to be implemented by the State Water Board and nine RWQCBs. The State Water Board also establishes Water Quality Control Plans (Basin Plans) and statewide plans. The Regional Water Boards carry out State Water Board policies and procedures throughout the state. Basin Plans designate beneficial uses for specific surface water and groundwater resources and establish water quality objectives to protect those uses.

Central Valley Regional Water Quality Control Board

The Regional Water Board is responsible for implementing its Basin Plan (2011) for the Sacramento River and its tributaries, including the Feather River. The Basin Plan identifies beneficial uses of the river and its tributaries and water quality objectives to protect those uses. Numerical and narrative criteria are contained in the Basin Plan for several key water quality constituents, including dissolved oxygen, water temperature, trace metals, turbidity, suspended material, pesticides, salinity, radioactivity, and other related constituents.

California Fish and Game Code Section 1602 Streambed Alteration Agreement

Under Chapter 6 of the California Fish and Game Code (CFGC), California Department of Fish and Wildlife (DFW) is responsible for the protection and conservation of the state's fish and wildlife resources. Section 1602 et seq. of the code defines the responsibilities of DFW and requires that public and private applicants obtain an agreement to "divert, obstruct, or change the natural flow or bed, channel, or bank of any river, stream, or lake designated by the DFW in which there is at any time an existing fish or wildlife resource or from which those resources derive benefit, or will use material from the streambeds designated by the department." A lake or streambed alteration agreement is required under Section 1602 of the CFGC for all activities that involve temporary or permanent activities within state jurisdictional waters.

3.3.3.3 Local

Butte County General Plan

The Butte County General Plan 2030 was adopted in October 2010 and amended on November 6, 2012 (County of Butte 2012). The plan includes a goal and a policy related to water resources. Refer to Chapter 3.2, *Flood Control and Geomorphic Conditions*, for other goals and policies related to water resources.

- **Goal W-1** Maintain and enhance water quality.
    - **Policy W-P1.1** County planning and programs shall be integrated with other watershed planning efforts, including best management practices, guidelines and policies of the Central Valley RWQCB.

Butte County Storm Water Management Program

Butte County has been covered under an NPDES Phase II MS4 General Permit since 2004, which covers the urbanized unincorporated areas within and around the City of Chico. As part of permit compliance, the Butte County Department of Public Works implements a SWMP (Butte County Public Works 2013).

3.3.4 Environmental Effects

Potential impacts of the proposed project on hydrology and water quality are discussed in the context of State CEQA Guidelines Appendix G checklist items.

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

Impact WQ-1: Effects on Surface Water Quality from Excessive Turbidity or Total Suspended Solids (less than significant for all components)

Ground disturbing activities and equipment staging during project construction would result in moderate ground disturbance in the project area. The maximum acreage to be disturbed would be approximately 120 acres, and would mainly result from interior channel grading, parking lot grading, and construction of berms, bridges, gabions, and weirs.

Two regulatory commitments (Section 2.4) target reducing or eliminating erosion and sedimentation effects: the SWPPP and the turbidity monitoring plan.

The SWPPP (Section 2.4.1) would identify erosion and sediment control measures to be implemented during construction activities to ensure the land disturbance activities do not cause erosion that would increase sedimentation in the Feather River. Site-specific erosion and sediment control measures would be developed by a qualified SWPPP developer as part of a SWPPP, a requirement of the NPDES Construction General Permit, including implementation of the SWPPP by a qualified SWPPP practitioner. A SWPPP typically includes erosion and sedimentation control measures, site management practices, materials and waste management, and general preventive maintenance and inspection. These measures would prevent excavated and eroded soils, construction materials, or debris from being transported to receiving waters. The proposed project SWPPP is anticipated to contain, but is not limited to, the following BMPs.

- **Timing of construction**. The construction contractor will conduct all construction activities during the typical construction season to avoid ground disturbance during the rainy season.
- **Staging of construction equipment and materials**. To the extent possible, equipment and materials will be staged in areas that have already been disturbed.
- **Minimize soil and vegetation disturbance**. The construction contractor will minimize ground disturbance and the disturbance/destruction of existing vegetation. This will be accomplished in part through the establishment of designated equipment staging areas, ingress and egress corridors, and equipment exclusion zones prior to the commencement of any grading operations.
- **Stabilize grading spoils**. Grading spoils generated during construction will be temporarily stockpiled in staging areas. Silt fences, fiber rolls, or similar devices will be installed around the base of the temporary stockpiles to intercept runoff and sediment during storm events. If necessary, temporary stockpiles may be covered with an appropriate geotextile to increase protection from wind and water erosion.
- **Install sediment barriers**. The construction contractor may install silt fences, fiber rolls, or similar devices to prevent sediment-laden runoff from leaving the construction area.
- **Stormwater drain inlet protection**. The construction contractor may install silt fences, drop inlet sediment traps, sandbag barriers, and similar devices.

- **Permanent site stabilization**. The construction contractor will install structural and vegetative methods to permanently stabilize all graded or otherwise disturbed areas once construction is complete. Structural methods may include the installation of biodegradable fiber rolls and erosion control blankets. Vegetative methods may involve the application of organic mulch and tackifier and/or the application of an erosion control seed mix. Implementation of a SWPPP by a qualified SWPPP practitioner will substantially minimize the potential for project-related erosion and associated adverse effects on water quality.
- **Monitoring**. The qualified SWPPP practitioner will routinely inspect the construction area to verify that the erosion and sediment control measures and other applicable BMPs specified in the SWPPP are properly implemented and maintained. The qualified SWPPP practitioner will make BMP adjustments in the field as necessary.

As part of a turbidity monitoring plan (Section 2.4.2), SBFCA or its contractor would monitor turbidity in the adjacent water bodies, where applicable criteria apply, to determine whether turbidity is being affected by construction and ensure that construction does not result in a substantial rise in turbidity levels above ambient conditions, in accordance with the Basin Plan turbidity objectives as required by the Central Valley RWQCB. The monitoring program would include monitoring ambient turbidity conditions at least 200 feet upstream and 200 feet downstream of construction activities. Grab samples would be collected at a downstream location that is representative of the flow near the construction site. If construction is creating a visible sediment plume, the sample would represent the plume. During all in-water construction activities, samples would be collected hourly to ensure compliance. During all other construction activities, samples would be collected on a random weekly basis.

If turbidity limits exceed Basin Plan standards, the construction-related earth-disturbing activities would be modified or additional BMPs would be implemented on site by the qualified SWPPP Practitioner to alleviate the problem. SBFCA or its contractor would notify the Central Valley RWQCB of the issue and provide an explanation of the cause.

In addition, suspended sediment has also been known to aid in the transport of absorbed nutrients, organic contaminants, and metals such as mercury, which is a CWA 303(d) listed impairments for the Feather River. The fraction of the metal absorbed is a constant, called the “partition” coefficient. Some metals are mostly absorbed and some are mostly dissolved. For example, mercury in its dissolved state is called methylmercury and methylmercury would not change in the river from increased transport of suspended sediments; however, total mercury could be disturbed and transported downstream from construction-related disturbed sediments. Total mercury is an example of a metal that is easily absorbed, so the concentration in the suspended sediment (as indicated by turbidity measurements) would be similar to the concentration of turbidity if total mercury is present in the disturbed soils where construction is taking place. Because construction would involve grading in the river for construction of the new permanent notched connection, it is anticipated that sediments in the Feather River may be disturbed. A temporary cofferdam or similar would be constructed to allow for the area adjacent to the permanent connection (box culvert) to be pumped out and facilitate construction of the new channel. The coffer dam would isolate the work area so that sediments are not discharged into the river. Following construction activities, the area would be stabilized with the box culvert structure or hydroseeded. Therefore, no additional construction impacts to water quality would occur within the river following removal of the cofferdam. The SWPPP (Section 2.4.1) will ensure that BMPs are implemented to contain

construction related sediments. The turbidity monitoring plan (Section 2.4.2) will ensure performance of the SWPPP.

The implementation of these regulatory commitments as part of the proposed project would reduce potential effects on surface water quality from construction-related turbidity or total suspended solids (TSS) to a less-than-significant level. No mitigation is required.

Vegetation Management: Mechanical removal of invasive plant species would involve cutting and removal of invasive plants by hand or by machines. Effective mechanical treatment of water primrose would dislodge sediment because roots should be removed. Hand crews would use clippers, loppers, weed wrenches, shovels, and chainsaws to pull or remove weeds. Machines such as backhoes, excavators, and brush hogs are desired in large areas with mature plants, especially where hand removal is infeasible. Mechanical removal of invasive plant species would be coordinated with chemical removal. The impact discussion above would be applicable to vegetation management activities, but only when heavy machinery (backhoes, excavators, and brush hogs) that has the potential to dislodge sediment is being used. The SWPPP (Section 2.4.1) and the turbidity monitoring plan (Section 2.4.2) would reduce the impacts on surface water quality from excessive turbidity or TSS from vegetation management activities to a less-than-significant level.

Hydraulic Improvements: The impact discussion above would be most applicable to hydraulic improvements, as these activities have the highest potential to degrade water quality due to the use of heavy machinery for in-water work. However, the SWPPP (Section 2.4.1) and the turbidity monitoring plan (Section 2.4.2) would reduce the impacts on surface water quality from excessive turbidity or TSS from hydraulic improvement activities to a less-than-significant level.

Recreation Features: The impacts from improvement and construction of recreational components would be similar in nature to those described above for the hydraulic improvements. The SWPPP (Section 2.4.1) and the turbidity monitoring plan (Section 2.4.2) would reduce the impacts on surface water quality from excessive turbidity or TSS from recreation features implementation to a less-than-significant level.

Impact WQ-2: Release of Contaminants into Adjacent Surface Water Bodies from Construction-Related Hazardous Materials (less than significant for all components)

The proposed project would involve the storage and use of toxic and other harmful substances near the Feather River (or in areas that drain to the Feather River), which could result in discharge of these substances into the Feather River or other water bodies. Construction activities would involve the use of heavy machinery, cranes, compactors, and other construction equipment that use petroleum products such as fuels, lubricants, hydraulic fluids, and coolants, all of which can be toxic to fish and other aquatic organisms. Contamination of channel/river bank and bed soils could result from construction activities because heavy machinery would be used within the ordinary high water mark of the channels. Spills of petroleum products and other pollutants related to machinery could occur during vehicle operation, refueling, parking, and maintenance. Improper handling, storage, or disposal of these materials in the vicinity of the study area could cause degradation of surface water quality if they are eventually washed into the study area (or the Feather River).

The combination of plans prepared for regulatory commitments described in Chapter 2, *Project Description*, would reduce the likelihood that such a release would occur, or reduce the effect of a release. These regulatory plans are the development of the SWPPP; a spill prevention, control, and

countermeasure plan (SPCCP); and a turbidity monitoring plan. All plans would be prepared prior to the commencement of construction activities.

An SPCCP is intended to prevent discharge of petroleum products into navigable waters or adjoining shorelines. SBFCA or its contractor will develop and implement an SPCCP to minimize the potential for and effects from spills of hazardous, toxic, and petroleum substances during construction and operation activities, as well as minimize the effects of unearthing previously undocumented hazardous materials. The SPCCP will be completed before construction activities begin. Implementation of this measure will comply with state and Federal water quality regulations. The SPCCP will describe spill sources and spill pathways as well as the actions that will be taken in the event of a spill (e.g., an oil spill from engine refueling will be cleaned up immediately with oil absorbents) or the exposure of an undocumented hazard. The SPCCP will outline descriptions of containment facilities and practices such as double-walled tanks, containment berms, emergency shut-offs, drip pans, fueling procedures, and spill response kits. It will also describe how and when employees are trained in proper handling procedure and spill prevention and response procedures.

SBFCA will review and approve the SPCCP before onset of construction activities and routinely inspect the construction area to verify that the measures specified in the SPCCP are properly implemented and maintained. SBFCA will notify its contractors immediately if there is a non-compliance issue and will require compliance.

If a spill is reportable, the contractor's superintendent will notify SBFCA, and SBFCA will take action to contact the appropriate safety and cleanup crews to ensure that the SPCCP is followed. A written description of reportable releases must be submitted to the Central Valley RWQCB Board and the California Department of Toxic Substances Control. This submittal must contain a description of the release, including the type of material and an estimate of the amount spilled, the date of the release, an explanation of why the spill occurred, and a description of the steps taken to prevent and control future releases. The releases will be documented on a spill report form.

Adherence to these regulatory commitments would reduce this impact on surface water bodies from construction-related hazardous materials use to a less-than-significant level. No mitigation is required.

Vegetation Management: Mechanical removal of invasive plant species would involve cutting and removal of invasive plants by hand or by machines. Hand crews would use clippers, loppers, weed wrenches, shovels, and chainsaws to pull or remove invasive plants. Machines such as backhoes, excavators, and brush hogs are desired in large areas with mature plants, especially where hand removal is infeasible. Mechanical removal of invasive plant species would be coordinated with chemical removal. The impact discussion above would be applicable to vegetation management activities, but only when heavy machinery (backhoes, excavators, and brush hogs) that has the potential for spills is being used. The SPCCP (Section 2.4.3) and the SWPPP (Section 2.4.1) would ensure that the risk of accidental spills from vegetation management activities would be minimized and that this impact would be less than significant.

Hydraulic Improvements: The impact discussion above would be most applicable to hydraulic improvements, as these activities have the highest potential to degrade water quality due to the use of heavy machinery for in-water work. However, the SPCCP (Section 2.4.3) and the SWPPP (Section 2.4.1) would ensure that the risk of accidental spills from hydraulic improvement activities would be minimized and that this impact would be less than significant.

Recreation Features: The effects from improvement and construction of recreational components would be similar in nature to those described above for the hydraulic improvements. The SPCCP (Section 2.4.3) and the SWPPP (Section 2.4.1) would ensure that the risk of accidental spills from recreation features implementation would be minimized and that this impact would be less than significant.

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

Impact WQ-3: Effects on Groundwater or Surface Water Quality Resulting from Contact with the Water Table (less than significant with mitigation for hydraulic improvements and recreational features; no impact for vegetation management)

Some excavation may be required as part of proposed project activities that could temporarily expose the local groundwater table. Dewatering may be necessary upstream of the hydraulic improvements in order to ensure that the workplace downstream would remain dry; however, this dewatering would not affect the local groundwater table due to its localized and temporally short nature. The proposed project activities would not involve groundwater extraction or the lowering of the local groundwater table. In addition, construction activities are not likely to interfere substantially with groundwater recharge because construction would occur during the dry season when recharge typically does not occur.

If dewatering is needed during the construction of any hydraulic improvements, the Low Threat Discharge and Dewatering NPDES permit would require treatment or proper disposal of the water prior to discharge. Treatment measures would be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. The associated BMPs that would be implemented could include the retention of dewatering effluent until particulate matter has settled before it is discharged, and the use of infiltration areas.

SBFCA and its contractors would adhere to regulatory commitments of the SWPPP, the SPCCP, and the turbidity monitoring plan as summarized under Impacts WQ-1 and WQ-2. Adherence to those regulatory commitments and implementation of Mitigation Measure WQ-MM-1 will reduce impacts on groundwater or surface water quality resulting from contact with the local groundwater table to a less-than-significant level.

Vegetation Management: The impact discussion above would be not applicable to vegetation management activities because dewatering would not be required for these activities. Furthermore, vegetation management activities would not involve groundwater extraction or the lowering of the local groundwater table.

Hydraulic Improvements: The impact discussion above would be most applicable to hydraulic improvements, as these activities may have the need for local dewatering. However, implementation of Mitigation Measure WQ-MM-1, described below, will minimize the effects on groundwater or surface water quality resulting from contact with the water table and ensure that this impact would be less than significant.

Recreation Features: Minimal dewatering is expected to be required for recreation feature implementation. The concrete pad needed for the existing portable restroom facilities would be

constructed on existing grade; however, footings for the vehicular bridge and two footbridges would need to be excavated. If the need for dewatering arises, Mitigation Measure WQ-MM-1 will minimize the effects on groundwater or surface water quality resulting from contact with the water table and ensure that this impact would be less than significant.

Mitigation Measure WQ-MM-1: Implement Provisions for Dewatering

Before discharging any dewatered effluent to surface water, SBFCA or its contractors will obtain a Low Threat Discharge and Dewatering NPDES permit from the Central Valley RWQCB. Under the dewatering permit, discharging activities involve extensive water quality monitoring in order to adhere to the strict effluent and receiving water quality criteria outlined in the permit. As part of the permit, the permittee will design and implement measures as necessary so that the discharge limits identified in the relevant permit are met.

Final selection of water quality control measures will be subject to approval by SBFCA. SBFCA will verify that coverage under the appropriate NPDES permit has been obtained before allowing dewatering activities to begin. SBFCA or its agent will perform routine inspections of the construction area to verify that the water quality control measures are properly implemented and maintained. SBFCA will notify its contractors immediately if there is a non-compliance issue and will require compliance.

c. Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

The proposed project would not alter the capacity of existing or planned stormwater drainage systems. In addition, the proposed project would not provide substantial additional sources of polluted runoff, and all disturbed areas would be revegetated to prevent soil erosion. Therefore, there would be no impact.

Vegetation Management: The discussion above is applicable to vegetation management activities.

Hydraulic Improvements: The discussion above is applicable to hydraulic improvement activities.

Recreation Features: The discussion above is applicable to recreation feature implementation.

d. Otherwise substantially degrade water quality?

Impact WQ-4: Other Effects on Water Quality, including Water Temperature (beneficial for all components)

As discussed above for checklist item *a*, implementation of the SWPPP (Section 2.4.1), the turbidity monitoring plan (Section 2.4.2), and the SPCCP (Section 2.4.3) would prevent impacts on water quality. In addition, SBFCA would follow the terms and conditions of a Section 401 Water Quality Certification, which would substantially reduce the potential for construction-related erosion and sedimentation to adversely affect water quality in the study area.

In addition, the proposed project would enhance stream flow primarily by increasing floodplain inundation within the study area; increase water purity and decrease temperature in the Feather River; and increase the extent of the active floodplain of the river, which would substantially add to the acreages of terrestrial and aquatic habitat. Floodplain restoration within the project area would lead to increased channel complexity, resulting in improved water quality and habitat throughout the study area. Restoration of riparian vegetation associated with vegetation management activities

would shade the flows that inundate the study area and help to reduce water temperatures in the Feather River downstream of the outflow weir.

The most substantial water quality improvement is the enhancement of subsurface (hyporheic) flows, which are important for surface water/groundwater interactions, fish spawning and rearing, and other biological and hydrologic processes. The water temperatures in the study area are expected to lower as a result of these subsurface flows (particularly in the shoulder seasons as water and air temperatures rise). This effect is considered beneficial.

Vegetation Management: The impact discussion above is applicable to vegetation management activities.

Hydraulic Improvements: The impact discussion above is applicable to hydraulic improvement activities.

Recreation Features: The impact discussion above is applicable to recreation feature implementation.