LAND USE

Significance Criteria

Land use impacts would be considered potentially significant if the water storage examples resulted in the following:

Incompatibility with existing land uses in the vicinity;

Adverse effects on agricultural resources or operations;

Permanent loss of prime farmland;

Conflicts with applicable environmental plans or policies;

Conflicts with general plan designations or zoning;

Displacement of residents; or

Disruption or division of the physical arrangement of any established community.

NOTE: Suggested Land Use - Related Modifications to Sections 3.0 in Underline - Strikeout, done 11/5/97.

1.0 INTRODUCTION

Surface water storage is an element common to each alternative under consideration for the CALFED Bay-Delta Program (Program). This technical report evaluates the potential consequences and mitigation strategies for several surface water storage options that have the potential to contribute to the Program objective of improving water management for beneficial uses of the Bay-Delta system. While specific reservoir projects have not been identified as part of the Program alternatives, specific reservoir storage capacities and component configurations relative to existing project facilities have been proposed. Storage capacity described within the alternatives varies from 1 million acre feet to 3 million acre feet (MAF), while facility configurations vary from on-stream to off-stream storage, with locations both north and south of the delta. Since no actual sites have been selected for inclusion in the alternatives, five example reservoir sites, representative of the general sizes and geographic locations described in the alternatives, were chosen for analysis to evaluate potential impacts from surface water impoundment.

Significance criteria are established to satisfy the California Environmental Quality Act (CEQA) requirement to determine the threshold at which impact magnitudes constitute significant impacts. Although the CEQA statutes and guidelines define a ?significant effect on the environment as a substantial, or potentially substantial, adverse change in the environment,? neither CEQA nor the CEQA guidelines establish mandatory thresholds or levels at which an adverse impact is considered significant. Thus CEQA allows the lead agency discretion in the selection, use, and application of significance criteria that are appropriate for the setting and circumstance of each project.

The National Environmental Policy Act (NEPA) does not have the same mandatory finding of significance as does CEQA, but NEPA does discuss how the significance of impacts can be defined in terms of context and intensity. The general nature of the planning and the range of settings and impacts involved with the Program dictate the use of qualitative thresholds of significance at this programmatic stage.

2.0 PROJECT DESCRIPTIONS

Specific sites were used to better focus information about potential impacts and mitigation measures. The reader is reminded however, that these sites are presented merely as examples to illustrate the types of impacts and mitigation measures associated with construction, operation and maintenance of storage reservoirs consistent with the requirements for surface storage and facility configurations contained within the alternatives. The inclusion of an example project does not indicate an endorsement of that project by CALFED. Project descriptions are taken from individual Facility Descriptions and Updated Cost Estimates prepared by the CALFED Storage and Conveyance Refinement Team (CALFED 1997a-1997g).

2.1 EXAMPLE 1: SITES/COLUSA RESERVOIR PROJECT

The Sites/Colusa Reservoir is an example of an off-stream north of Delta storage project that would be filled primarily through diversions of winter and spring surplus flows pumped from the Sacramento River. Minor additional runoff contributions from local drainage are anticipated. This project could provide long-term storage, which would increase the reliability of water supplies during drought conditions. The Tehama-Colusa Canal (T-C Canal) and the Glenn-Colusa Irrigation District Canal are the main existing conduits that could be utilized for filling the reservoir. Enlargement and extension of the T-C Canal and construction of an additional new diversion from the Sacramento River into the T-C Canal, the Chico Landing Intertie, are also components of this project. Water would be delivered to the Sites/Colusa reservoir through the enlarged T-C Canal via the proposed Logan Forebay and Pumping Generating Plant.

2.1.1 Location

The Sites/Colusa Reservoir would be located within northern Colusa County and southern Glenn County, about 10 miles west of Maxwell across the drainages of Stone Corral, Hunters, Logan, and Funks Creeks. The area is rural in nature and very sparsely populated. The small community of Sites and a road near Stonyford are within the reservoir inundation area.

2.1.2 Project Components

Reservoir

The reservoir would be formed by constructing four large dams across the major drainages and several smaller saddle dams along the low divides between drainages. The large dams include a 294-foot high dam on Stone Corral Creek (Sites Dam), a 302-foot high dam on Funks Creek (Golden Gate Dam), a 282-foot high dam spanning Hunters Creek (Hunters Dam), and a 272-foot high dam across Logan Creek (Logan Dam). These dams would be zoned earth embankment types with crest elevations of 541 feet above mean sea level (MSL) and crest widths of 40 feet. Four saddle dams ranging from 71 to 260 feet in height would be required along Logan Ridge and five saddle dams ranging from 11 to 130 feet in height would be required along the northern boundary of the reservoir.

The maximum operating water surface elevation would be at 532 feet above MSL and would inundate approximately 29,600 acres. Total storage capacity for the Sites/Colusa Reservoir would be 3.3 MAF.

Tehama-Colusa Canal Enlargement and Expansion

Existing Canal Configuration

The existing canal is 111 miles long, extending from the Red Bluff Diversion Dam on the Sacramento River in the north to Bird Creek in Yolo County in the south. The capacity of the canal at Red Bluff is 2,530 cubic feet per second (csf), diminishing to 1,700 csf at the terminus. Funks Reservoir, at about mile 67 of the canal and about five miles west of the town of Maxwell in Colusa County, is the only regulating facility for the canal. The T-C Canal Enlargement would increase the capacity of the canal from Red Bluff to Funks Reservoir.

The Red Bluff Diversion Dam creates the necessary hydraulic head to divert water from the Sacramento River into the T-C Canal. The Diversion Dam consists of eleven, 60-foot wide concrete overflow weir sections, a 60-foot wide concrete sluiceway, the headworks to the T-C Canal, fishways at both abutments of the dam, and low earth dikes on each abutment.

The T-C Canal Fish Screens and Bypass Facilities allow water to be diverted from the Sacramento River while minimizing harm to fish that may be present. The fish are prevented from entering the canal by slowly rotating drums placed diagonally across a settling basin, then collected into bypass pipes and returned to the center of the Sacramento River downstream of the dam.

Eight individual reaches, identified by major drainage or creek crossings at each end, divide the existing T-C Canal. The T-C Canal Enlargement would involve the northern end of the existing canal and include five of the eight reaches, while the T-C Canal Extension would involve the remaining three reaches south of Funks Reservoir. The extension project also includes extending the T-C Canal from its present terminus into southern Yolo County.

Proposed Canal Configurations

There are two potential configurations for increasing the capacity of the existing canal Õ the existing canal structure could be enlarged; or a parallel canal adjacent to the existing canal could be constructed. Both options would require increasing the capacity of the intake structure from the Red Bluff Diversion Dam with an equal increase in the capacity of the fish screens. Additionally, a 21-mile extension of the canal is part of the project.

Enlarged Canal Configuration

This option would increase the capacity of the five canal reaches between the Red Bluff Diversion Dam and Funks Reservoir to 5,000 csf by enlarging the existing canal structure. The T-C Canal intake facility would be enlarged to a total capacity of 5,000 csf and the existing fish screening facility would be expanded accordingly. The expansion would require excavation and lining of the existing canal, enlargement of 24 siphons, construction of 58 road crossings, and establishment of one check structure with each reach.

Parallel Canal Configuration

This option would increase the capacity of the canal to at least 5,000 cfs for all eight reaches. In this configuration a separate canal would be constructed parallel to the existing canal with a capacity of 3,500 csf. The parallel canal would require an additional 500 feet of right-of-way adjacent to the existing canal. The expanded right-of-way would allow sufficient distance between the canals for construction and maintenance activities. The T-C Canal intake facility and fish screens would be enlarged similarly to that required for the Enlarged Canal Configuration. In addition, a separate intake structure would be constructed for the parallel canal.

T-C Canal Extension

The canal extension from its present terminus at Bird Creek to the proposed Lake Berryessa Winters Pumping-Generating Plant would add approximately 21 miles to the total length of the canal. The extension section would be concrete-lined with a capacity of 5,000 cfs, and would include construction of siphons, check structures, bridges, overchutes, and culverts. The extension would require a new 300-foot right-of-way and new crossings would include Oat Creek, Cache Creek, and Highway 16.

Chico Landing Intertie

The Chico Landing Intertie would connect the Sacramento River south of Hamilton City to the existing T-C Canal just south of Greenwood. The Intertie would provide an alternate means of diverting water from the river to the new reservoir. The Intertie would consist of approximately 10 miles of concrete-lined canals, three pumping plants, and a screened diversion on the Sacramento River. The Chico Landing Intertie has a design capacity of 5,000 cfs.

The diversion facility would be composed of twenty-four, 32-foot bays and two, 24-foot bays with 2, 6-foot by 8-foot slide gates per bay and would include fish screens designed to meet the California Department of Fish and Game velocity limits.

All of the canal reaches would have the following common dimensions Õ concrete-lined trapezoidal sections with 1.5:1 side slopes and a bottom width of 60 feet. The canal would be constructed in both cut and fill. The proposed canal alignment would cross several existing facilities. It would cross the Glenn-Colusa Canal and the Southern Pacific Railroad in inverted siphons. The alignment also would include nine irrigation ditch crossings and nine county road crossings. The required right-of-way width is 350 feet.

Logan Conveyance System

The proposed conveyance system from the T-C Canal to the Sites/Colusa Reservoir would be located approximately four miles south of Willows and nine miles north of the existing Funks Reservoir. The system would include the following features:

Logan Forebay, a 400 acre feet impoundment formed by a low earth dam on Logan Creek immediately west of the T-C Canal;

Logan Pumping-Generating Plant, located at the base of Logan Dam, which would lift water a maximum of 322 feet into the Sites/Colusa Reservoir; and

Logan Canal, a 5,000 cfs capacity, 1.7 mile long canal connecting Logan Forebay to the Logan Pumping-Generating Plant.

The Logan Pumping-Generating Plant would have a capacity of 5,000 cfs and would serve both inflow and outflow requirements for the Sites/Colusa Reservoir. An open chute-type spillway with an uncontrolled crest (ungated) with a capacity of 2,500 cfs would discharge from the reservoir into Hunters Creek. The small spillway would be adequate to handle the maximum probable project flood because of the large water surface area compared to the small, relatively dry tributary drainage area.

Outlet works facilities for Sites/Colusa Reservoir would include outlets at Logan Dam and Golden Gate Dam. The outlet at Logan Dam would contain the penstock for the Logan Pumping-Generating Plant and would be used both to fill Sites/Colusa Reservoir and to make releases into Logan Forebay. The outlet at Golden Gate Dam would be used only to help during an emergency evacuation. Department of Water and Power (DWR), Division of Safety and Dams requires that during an emergency evacuation, 10 percent of the maximum water depth must be released in 10 days. This equates to an estimated release capacity of 44,000 cfs or 22,000 cfs at each outlet works facility.

2.2 EXAMPLE 2: THOMES-NEWVILLE RESERVOIR PROJECT

The Thomes-Newville Reservoir Project, an example of an off-stream north of Delta storage reservoir, would function as storage for available flows from Thomes Creek, North Fork Stony Creek, and Stony Creek, as well as for surplus flows from the Sacramento River. This project could increase the water supply opportunities and contribute to the reliability of water supplies during drought conditions. Facilities associated with the project include Newville and Tehenn Reservoirs located on North Fork Stony Creek, a diversion facility from Thomes Creek to Newville Reservoir, a two-way conveyance facility from Tehenn Reservoir to the existing Black Butte Reservoir on the mainstem of Stony Creek, and a two-way conveyance canal facility from the Tehama-Colusa Canal to Black Butte Reservoir. The Thomes-Newville Reservoir Project would have a storage capacity of 3.08 MAF.

There would be four water sources for the Thomes-Newville Reservoir Project. Flows from the North Fork Stony Creek would discharge directly into the proposed reservoir. Thomes Creek flows would be diverted from Thomes Creek and conveyed to the reservoir by a gravity canal. Mainstem Stony Creek flows would be conveyed from Black Butte Reservoir to Newville Reservoir via Tehenn Canal, Tehenn Pumping-Generating Plant, Tehenn Reservoir, and Newville Pumping-Generating Plant. Sacramento River flows would be diverted into the Tehama-Colusa Canal and conveyed into Black Butte Reservoir via Sour Grass Canal and Sour Grass Pumping-Generating Plant. From Black Butte Reservoir, the Sacramento River water would be conveyed to Newville Reservoir via the Tehenn Canal and

Reservoir.

2.2.1 Location

The Thomes-Newville Reservoir Project would be located approximately 25 miles west of Orland on the North Fork of Stony Creek in Glenn County. Three storage facilities, built between 1909 and 1970 as part of the Orland Project, are located on Stony Creek. The East Park Reservoir was constructed in 1909 in the upper watershed followed by Stony Gorge Reservoir, constructed in 1928, and Black Butte Reservoir further downstream, completed in 1970. The Black Butte Reservoir now serves as the main regulating facility for the distribution system of the Orland Project. The Thomes-Newville Reservoir Project would be located approximately 10 miles upstream of the Black Butte Dam.

The area is sparsely populated with relatively few structures. Approximately eight miles of public roads exist within the inundation area of Newville Reservoir. The Paskenta-Round Valley Road, a paved two-lane county road, passes through the north end of the reservoir and another county road crosses northwestward through the reservoir from the dam site to Paskenta-Round Valley Road. These roads would be relocated and upgraded to current county standards. Total length of new road construction would be approximately 10 miles.

2.2.2 Project Components

Reservoir

The Newville Reservoir would have a storage capacity of 3.08 MAF and would be impounded by one main dam (Newville Dam) across North Fork Stony Creek and 10 saddle dams located on Rocky Ridge on the eastern and northern boundaries of the reservoir. The main dam would be an earthfill embankment structure, rising 400 feet above the existing streambed to an elevation of 1,000 feet above MSL. The dam crest length would be approximately 3,200 feet. The proposed reservoir would have a normal pool elevation of 980 feet above MSL and a surface area of 16,700 acres.

Spillway and Inlet-Outlet Works

The spillway would have a maximum capacity of 35,700 cfs and would be located 200 feet west of the right dam abutment. The spillway would consist of two submerged radial gates in a rectangular reinforced concrete-lined channel. The gates would be 20 feet wide by 30 feet high. The sill of the gates would be at an elevation of 930 feet above MSL. The emergency spillway, with a capacity of 8,000 cfs, would consist of two 20-foot long uncontrolled weirs, each at an elevation of 985 feet above MSL. The gated spillway and the emergency spillway would discharge into a common concrete lined tailrace and stilling basin.

The inlet-outlet works for the Newville Reservoir would have a capacity of 5,000 cfs to convey water pumped into the reservoir and to facilitate releases from the reservoir. The primary features of the inlet-outlet works would be a 2,100-foot long tunnel through the right

abutment of the dam and a sloping intake conduit with nine evenly spaced levels of inlets between the minimum and normal pool elevations. The emergency release requirement of the proposed reservoir would be 32,000 cfs. This release would be made through the gated spillway and the inlet-outlet works of the dam.

Newville Pumping-Generating Plant

The plant would be located at the toe of the Newville Dam to lift water from Tehenn Reservoir into Newville Reservoir and to generate power from releases from Newville Reservoir into Tehenn Reservoir. The plant would have a total capacity of 5,000 cfs.

Thomes Creek Diversion Structure and Canal

The diversion structure would be located in Thomes Creek, approximately nine miles upstream of the town of Paskenta and would consist of a conventional concrete gravity dam. The dam crest would be about 90 feet above the existing streambed at an elevation of 1,050 feet above MSL. A 500-foot wide overflow section with a crest elevation of 1,035 feet above MSL would be located on the left abutment. Two additional 20-foot wide and 50-foot high radial gates located in the right abutment could pass up to 41,000 cfs. The sill of the gates would be located 25 feet above the original streambed. These gates would be opened to allow flood flows to pass and flush accumulated sediment out of the diversion pool. During most of the winter, the gates would be closed so water could be diverted to Newville Reservoir.

A concrete-lined canal would convey water 13,000 feet from Thomes Creek to Newville Reservoir. The canal would be 30 feet wide and 16.5 feet deep with a capacity of 10,000 cfs.

Tehenn Reservoir

Tehenn Reservoir would be formed by constructing Tehenn Dam immediately downstream of Newville Dam across the North Fork Stony Creek. The reservoir would back water to the Newville Pumping-Generating Plant located at the base of Newville Dam, where the pumping-generating plant would lift the water into Newville Reservoir. Tehenn Dam would rise 112 feet above the original streambed and would have a crest length of 2,500 feet. Tehenn Reservoir would be capable of storing 32,500 acre feet at normal pool elevation of 610 feet above MSL.

The spillway for Tehenn Reservoir would be a concrete-lined ungated chute-type on the left abutment of the dam with a capacity of 50,000 cfs. The chute would extend 1,300 feet, ending in a concrete stilling basin. The spillway crest length would be 250 feet. The inlet-outlet works for Tehenn Dam would consist of a steel-lined concrete conduit under the left abutment with a capacity of 5,000 cfs.

Tehenn Pumping-Generating Plant

The Tehenn Pumping-Generating Plant would lift water from Black Butte Reservoir and the Tehenn Canal into Tehenn Reservoir and also would generate power by releasing water from Tehenn Reservoir to Black Butte Reservoir. The plant would have a total capacity of 5,000 cfs.

Tehenn Canal

Tehenn Canal would deliver a maximum flow of 5,000 cfs in either direction between Black Butte Reservoir and Tehenn Pumping-Generating Plant. It would be approximately five miles long, roughly following the natural channel of North Fork Stony Creek and would require a maximum cut of 120 feet.

Black Butte Pumping-Generating Plant

The Black Butte Pumping-Generating Plant would lift water from the Black Butte Canal into Black Butte Reservoir and would generate power from releases from Black Butte Reservoir to the Black Butte Canal. The plant would be located just downstream of the existing Black Butte Dam and would be connected to the dam inlet-outlet works by a new 1,800-foot tunnel. The pumping-generating plant would have a capacity of 5,000 cfs.

Black Butte Canal

The Black Butte Canal would be a two-way conveyance facility connecting the Black Butte Pumping-Generating Plant and Black Butte Reservoir with the Sour Grass Pumping-Generating Plant. The concrete-lined canal would have a capacity of 5,000 cfs and would be approximately 4.5 miles long between the Black Butte and Sour Grass Pumping-Generating Plants. Near Black Butte, the canal would require a maximum cut of approximately 190 feet.

Sour Grass Pumping-Generating Plant

The Sour Grass Pumping-Generating Plant would lift flow into the Black Butte Canal during pumping operations and would generate power during release operations from Black Butte Reservoir. The pumping-generating plant would have a capacity of 5,000 cfs. Releases made through this plant and the Black Butte Pumping-Generating Plant would be used to supply supplemental water from storage in Newville Reservoir for use in the Tehama-Colusa Canal.

Sour Grass Canal

The Sour Grass Canal would convey water in either direction between the Tehama-Colusa Canal and the Sour Grass Pumping-Generating Plant. The concrete-lined canal would have a capacity of 5,000 cfs and a total length of approximately 4.5 miles, generally following the alignment of Sour Grass Creek.

2.3 EXAMPLE 3: WEST SAN JOAQUIN VALLEY RESERVOIR PROJECT

The West San Joaquin Valley (WSJV) Reservoir Project is an example of an off-stream storage project south of the Sacramento-San Joaquin Delta. This reservoir would be adjacent to the existing San Luis Reservoir and would be connected with the California Aqueduct so that excess Delta flows could be conveyed to and stored within the reservoir. The primary purpose of the WSJV Reservoir would be to reduce the frequency and magnitude of water shortages for water users dependent on the Delta by increasing the reliability of available supplies. This type of additional off-stream storage in association with the California Aqueduct could increase the water supply reliability of the State Water Project (SWP) and the Central Valley Project (CVP). The additional storage provided also could add flexibility to the SWP and CVP delivery systems and permit shifting Delta diversions toward months with fewer Delta impacts.

The project would consist of a storage reservoir, pumping-generating plants, and conveyance canals. The existing Los Banos Reservoir would be modified for use as a regulating facility for the WSJV Reservoir. The existing Los Banos Retention Dam, originally constructed to protect the California Aqueduct from flood flows carried by Los Banos Creek, would be improved to accommodate the proposed pumped-storage operations of the WSJV Reservoir. The project would store available flows diverted from the Delta at the SWP?s Banks Pumping Plant and, possibly, the CVP?s Tracy Pumping Plant. Water diverted from the delta would be conveyed to the existing Los Banos Reservoir through SWP?s California Aqueduct or CVP?s Delta Mendota Canal, then pumped to the WSJV Reservoir for storage. Water stored in the WSJV Reservoir would be released into Los Banos Reservoir and the California Aqueduct through a series of pumping-generating facilities. The new reservoir would operate similarly to the San Luis Reservoir facilities.

2.3.1 Location

The WSJV Reservoir Project would be located in Merced County approximately six miles west of the California Aqueduct and 80 miles south of the Sacramento-San Joaquin Delta. The main dam would be constructed in a narrow canyon on Los Banos Creek. The Los Banos Valley, extending several miles upstream of the dam site, would form the reservoir inundation area. The area is rural in nature with scattered ranches. The existing San Luis and Los Banos Reservoirs are located immediately downstream of the project site

Construction of the WSJV Reservoir Project would require the relocation or reconstruction of 12.5 miles of roads and the construction of approximately 20 miles of new roads for

recreation and facility access. Additional relocations include approximately 50 residences, a 500kV transmission line, two crude oil pipelines, and a natural gas pipeline.

2.3.2 Project Components

Reservoir

The reservoir would be formed by the construction of a zoned earthfill dam, rising 436 feet above the streambed of Los Banos Creek. The crest of the dam, at 806 feet above MSL, would be 40 feet wide and 2,160 feet long. At normal pool, the surface elevation of the reservoir would be at 786 feet above MSL and would have a surface area of approximately 13,810 acres. Total storage capacity for the WSJV Reservoir would be 2.03 MAF.

Several saddle dams would be required to achieve the proposed storage capacity. Salt Creek Saddle Dam would be located about 2.5 miles southeast of the primary dam site. This dam would be a rolled earthfill embankment dam with a crest width of 40 feet, length of 4,500 feet and height of 253 feet. A 36-inch diameter steel outlet conduit would be placed along the bed of Salt Creek to divert the stream during construction and for stream releases during normal reservoir operations.

Harper Lane and San Carlos Saddle Dams would be located at the northwest and southeast corners of the reservoir, respectively. The Harper Lane Saddle Dam would be a zoned earthfill dam with a crest height of 78 feet and a length of 900 feet. Billie Wright Road would be relocated along the 40-foot wide dam crest. San Carlos Saddle Dam would be a zoned earthfill embankment structure with a crest height of 81 feet and a length of 650 feet. A 600-foot long, 20-foot high dike would be required at a saddle location approximately 900 feet to the west. These two sections would be joined as one continuous embankment with a total length of 1,250 feet.

Spillway and Inlet-Outlet Works

Both the spillway and the emergency outlet works would be located on the left abutment of the dam. The spillway inlet would be an ungated, 30-foot diameter spillway tunnel extending approximately 14,480 feet to a concrete-lined open chute section that would extend about 340 feet to a stilling basin. The inlet-outlet works for the project would be designed to transfer up to 4,650 cfs between WSJV Reservoir and the pumping-generating plant during generating operations, and up to 3,500 cfs during pumping operations. This facility also would have the capacity to release 16,000 cfs during emergency drawdown. The main features of the inlet-outlet works would be a free-standing intake tower with an overall height of 308 feet, a concrete-lined pressure tunnel with a full-length steel liner, and the pumping-generating plant penstocks.

The emergency outlet works would be designed to evacuate 10 percent of the maximum reservoir depth in 10 days for a peak drawdown capacity of 26,000 cfs. This flow would be passed through the emergency outlet portion of the spillway, with a capacity of 10,000 cfs

and through two bypasses in the inlet-outlet works with a combined capacity of 16,000 cfs.

Los Banos Detention Dam and Reservoir

The existing detention dam is a zoned earthfill embankment with a height of 167 feet and a crest length of 1,370 feet. Several modifications would be required to facilitate the proposed pumped-storage operation for WSJV Reservoir. The existing upstream shell of the Los Banos Detention Dam has insufficient permeability to be free-draining under drawdown rates anticipated for the proposed pumping-storage option. Replacement of the existing shell material with more pervious material would be necessary. Additionally, the existing spillway would be supplemented with a new spillway located on the right abutment of the Los Banos Detention Dam. Maximum release capacity would be 17,600 cfs and would be sized to meet the maximum discharge resulting from an emergency drawdown of WSJV Reservoir. Construction of new inlet-outlet works also are anticipated.

Conveyance Facilities

Two conveyance channels, capable of transferring water in either direction, would be required to move water from the California Aqueduct to the WSJV Reservoir. Both channels would be capable of carrying 3,500 cfs in pumping mode. In generating mode, Channel 1 would be capable of carrying 4,650 cfs while Channel 2 would carry 5,800 cfs.

Channel 1, located between the Los Banos Detention Dam and California Aqueduct, would be concrete-lined and approximately one mile in length. Primary features would include an outlet culvert at Los Banos Creek, an emergency drawdown channel, confluence facility, turnout structure for the aqueduct, a bridge crossing for both Interstate 5 and Canyon Creek, and various animal crossings. The freeway bridge would be 100 feet wide and 240 feet long. Channel 2, between the WSJV Reservoir and the Los Banos Reservoir, would be unlined and approximately 1.4 miles long.

Pumping-Generating Plants

Two pumping-generating plants would be constructed as part of this project. Plant 1 would convey water from the California Aqueduct to the Los Banos Reservoir. Maximum plant power requirements in pumping mode would be about 54 megawatts (MW) with a maximum flow of 4,500 cfs. The maximum plant generation would be about 50 MW with a maximum flow of 5,800 cfs.

Plant 2 would lift water from the Los Banos Reservoir to the WSJV Reservoir and would recover energy during WSJV Reservoir releases. The reversible units in this facility would require a maximum of 174 MW in pumping mode with a maximum flow of 4,500 cfs. Maximum plant generation would be 167 MW with a maximum flow of 5,800 cfs.

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2.4 EXAMPLE 4: MONTGOMERY RESERVOIR PROJECT

The Montgomery Reservoir is an example of an off-stream south of Delta storage project in the San Joaquin Valley that would be used to store and re-regulate available water from Lake McClure and/or surplus flows on the Merced River and flood control on Dry Creek. The Montgomery Reservoir could help develop conservation storage in the San Joaquin Valley, which could potentially develop additional water supplies for agricultural and environmental uses on the San Joaquin River.

The project would include a storage reservoir and dam, a pumping plant, a two-way conveyance canal, and a discharge pipeline. The project would store available excess flows diverted from the Merced River. Water diverted would be conveyed through an expansion of the existing North Side Canal. The canal would be modified from a one-way to a two-way canal to facilitate conveyance to and from Montgomery Reservoir. This two-way conveyance facility from Merced Falls Reservoir to Montgomery Reservoir would convey up to 2,000 cfs by gravity to Montgomery Reservoir from October through March and about 1,000 cfs to Merced Falls Reservoir from April through September. Montgomery Reservoir potentially could contribute to the regulation of flows from the American, Sacramento, and Stanislaus Rivers and provide an additional source to serve local demands.

2.4.1 Location

The Montgomery Reservoir would be located in northeastern Merced County approximately 60 miles southeast of the Sacramento-San Joaquin Delta. The project dam would be located on Dry Creek approximately 16 miles above the confluence with the Merced River near the town of Snelling. The dam site is within the Merced Irrigation District (MID) service area. Through operation of the New Exchequer Dam, MID supplies approximately 570,000 acre-feet of water per year for municipal and agricultural uses. The project area is rural in nature and sparsely populated. Relocation would be required for County Road 59J, a telephone line, and approximately 4.5 miles of additional roads, including portions of Olsen Road and Fields Road that would be inundated.

2.4.2 Project Components

Existing Facilities

Montgomery Reservoir would be located about 10 miles west of New Exchequer Dam. Owned and operated by MID, New Exchequer Dam is located on the Merced River and impounds Lake McClure. Approximately eight miles downstream of New Exchequer Dam is McSwain Dam and roughly one mile further downstream from McSwain Dam is the Merced Falls Diversion Dam. MID uses Merced Falls Diversion Dam to divert water into the North Side Canal. Snelling Dam is located about three miles downstream of Merced Falls Diversion Dam and is used by MID to divert water into the Main Canal, serving areas south of the Merced River.

Montgomery Reservoir

Montgomery Reservoir would be formed by constructing a zoned earthfill dam with a height of 101 feet above the original streambed of Dry Creek. The dam crest would be 30 feet wide at an elevation of 336 feet above MSL. The reservoir would have a surface water elevation of 325 feet above MSL and a surface area of approximately 8,050 acres. Total storage capacity would be 240,000 acre-feet. Depending on reservoir configuration, the project could inundate up to 8,100 acres. According to the 1961 Reclamation feasibility-level design, eight saddle dams of various lengths and heights also would be required; further details regarding these dams were not included in the feasibility design.

Spillway, Pumping Plant, and Outlet Works

The spillway would be a glory hole-type with an inlet elevation of 329 feet above MSL and an outlet elevation of 310 feet above MSL. The spillway maximum design capacity is 1,000 csf and would be located on the left side of the main embankment dam, draining into an unnamed tributary of Dry Creek. A pumping plant would be required on the discharge pipeline to pump water from Montgomery Reservoir to the North Side Canal. The capacity of this pumping plant would be 1,000 cfs.

The Outlet Works would be located near the center of the dam and would discharge water into Dry Creek with a maximum outlet capacity of 5,200 csf at an elevation of 237 feet above MSL. The maximum outlet capacity is capable of releasing the emergency evacuation volume of approximately 3,650 cfs as defined by DWR, Division of Safety of Dams.

Conveyance Facilities

The existing North Side Canal would be expanded from a one-way gravity canal to a two-way canal to deliver water to the proposed reservoir. The total length of the expansion would be approximately 30,000 feet from the Merced Falls Diversion Dam to the outlet at the proposed reservoir. A new discharge pipeline with 1,000 cfs capacity would be constructed from the pumping plant at the base of the embankment dam, extending approximately 15,000 feet to the North Side Canal. The discharge pipeline would deliver water from the proposed reservoir back to the North Side Canal. Water delivered to the North Side Canal could flow in either direction from the connection point with the pipeline.

The Main Canal Pipeline would be constructed to connect the North Side Canal with the Main Canal. This pipeline would be approximately 4,000 feet long and cross beneath the Merced River. The Main Canal Pipeline would facilitate delivery of Montgomery Reservoir water to MID users south of the Merced River, thereby reducing diversions from the Merced River to the Main Canal at Snelling Diversion Dam. For the purposes of this report, an adequate right of way width, sufficient for construction and maintenance of all canals and pipelines, was determined to be 300 feet.

2.5 EXAMPLE 5: LOS VAQUEROS RESERVOIR ENLARGEMENT PROJECT

The Los Vaqueros Reservoir Enlargement Project is an example of a modification to an existing off-stream south of Delta facility to accommodate increased storage. The Los Vaqueros Reservoir is currently under construction by Contra Costa Water District for water quality and emergency storage purposes. The Enlargement Project would increase storage capacity from 100,000 acre feet to 1.06 MAF. The Los Vaqueros Dam, currently being constructed, would be removed to build a larger earthfill dam. In addition to the larger dam, the project facilities would include the Kellogg Forebay, pumping-generating plants, and conveyance facilities.

A larger capacity would enable storage of excess Delta flow pumped at Banks Pumping Plant. The stored water would be released for needs in the California Aqueduct and to offset Delta diversions during environmentally critical periods. Enlargement of this off-stream storage facility could increase water supply reliability of the SWP and CVP and could increase flexibility of Delta export operations for both projects.

Available Delta flows would be pumped from Clifton Court Forebay, first to Kellogg Forebay, and then into the enlarged reservoir via the Los Vaqueros Pumping-Generating Plant. Storage releases also would generate energy at the Plant. The Tuway Canal would convey water in either direction between Kellogg Forebay and the California Aqueduct.

2.5.1 Project Location

The Los Vaqueros Reservoir Enlargement Project would be located in Contra Costa County on the eastern slope of the Coast Range. The current construction site is located about 11 miles south of Antioch and seven miles northwest of the Clifton Court Forebay. The total project lands to be acquired would be approximately 7,000 acres.

2.5.2 Project Components

Reservoir

The enlarged Los Vaqueros Reservoir would be formed by removal of the dam currently under construction and replacement with a main dam built across Kellogg Creek. Construction also would include four saddle dams. The reservoir would have a water surface elevation of 780 feet above MSL, a surface area of 4,830 acres, and a storage capacity of 1.065 MAF. The main dam would be a zoned earth embankment structure with a crest elevation of 800 feet above MSL, a height of 505 feet above the streambed, and a crest length of 2,700 feet.

Spillway and Inlet-Outlet Works

The enlarged Los Vaqueros Reservoir and Dam would have a 2,200-foot long concrete-lined, chute-type spillway structure located on the right abutment. The inlet-outlet works would have three functions Õ to enable rapid release of reservoir storage during emergencies; provide a choice of reservoir depths during normal operational releases; and provide a means to pump water into the reservoir. It would consist of three concrete- and steel-lined pressure tunnels of varying levels with a normal operating capacity of 5,000 cfs and an emergency capacity of 11,800 cfs to meet the release requirements of DWR?s Division of Safety and Dams. Both the spillway and the river outlet works facilities could safely pass the maximum probable flood flow.

Kellogg Forebay

Kellogg Forebay would serve as a transfer facility between the Kellogg Pumping Plant and the Los Vaqueros Pumping-Generating Plant. It would be formed by a dam on Kellogg Creek and one saddle dam. The main dam, located approximately 1.5 miles south of Camino Diablo Road and approximately three miles downstream of the Los Vaqueros Dam, would be a zoned earthen embankment. The dam would be 90 feet in height with a crest elevation of 260 feet above MSL. The Kellogg Forebay would have a normal water surface elevation of 244 feet above MSL, a surface area of 124 acres, and a storage capacity of 4,270 acre feet.

In addition, the main Kellogg Forebay Dam would have a 340-foot long concrete-lined, chute-type spillway structure located on the right abutment. The outlet works would have a maximum release capacity of 45 cfs designed to meet the emergency release requirements of DWR?s Division of Safety and Dam. Both the spillway and the outlet works could safely pass the maximum probable flood flow.

Conveyance Facilities

The conveyance facilities would consist of the Los Vaqueros Pipeline, the Los Vaqueros Pumping-Generating Plant, the Tuway Canal, a widened North San Joaquin Intake Channel, the Kellogg Pumping Plant, and the Kellogg Pumping Plant Discharge Facility.

The Los Vaqueros Pipeline would be located between the Los Vaqueros Reservoir and the Los Vaqueros Pumping-Generating Plant. This 5,000 cfs capacity pipeline would consist of nine 11,000-foot long, 144-inch diameter pipes and would convey water to and from the enlarged reservoir. The 5,000 cfs capacity Los Vaqueros Pumping-Generating Plant would be located at Kellogg Forebay. The Plant would lift water from the forebay to Los Vaqueros Reservoir through the Los Vaqueros Pipeline. The pumping plant also would generate power from storage releases from Los Vaqueros Reservoir to Kellogg Forebay.

Tuway Canal would connect Kellogg Forebay to the California Aqueduct. It would convey water pumped by the existing Harvey O. Banks Delta Pumping Plant or by the proposed Kellogg Pumping Plant to Kellogg Forebay. The canal would be a 4.5 mile long concrete-

lined structure and have a capacity to carry 5,000 cfs in either direction. Tuway Canal would have a top width of 135 feet, a bottom width of 60 feet, and a depth of 25 feet from the normal operating water surface level. The canal would include a 2,900-foot long siphon structure consisting of six, 23-foot by 23-foot concrete boxes. The canal right-of-way would consist of 410 acres.

The North San Joaquin Intake Channel conveys water from Clifton Court Forebay to Harvey O. Banks Pumping Plant. The intake channel would be widened to increase its capacity from 10,900 cfs to 15,900 cfs. The 2-mile long channel would have a top width of 304 feet, a bottom width of 120 feet, and a depth of 46 feet from the normal operating water surface elevation.

The Kellogg Pumping Plant would be located near the top of the North San Joaquin Intake Channel on the north side of Harvey O. Banks Pumping Plant. The pumping plant would lift water from the enlarged intake channel into the Tuway Canal. The plant would have a capacity of 5,000 cfs. The Kellogg Pumping Plant Discharge Facility would have a capacity of 5,000 cfs and would consist of nine 3,200-foot long, 144-inch diameter pipelines, a 1,000-foot long canal, and three, 25-foot by 55-foot radial gates.

During reservoir filling operations, the Kellogg Pumping Plant would pump water from the North San Joaquin Intake Channel leading to Harvey O. Banks Pumping Plant, into the Tuway Canal. Tuway Canal, which can convey flows in either direction, would transport the pumped Delta water to Kellogg Forebay. From the forebay, water would be pumped through the Los Vaqueros Pipeline into the enlarged Los Vaqueros Reservoir.

Water released from the enlarged Los Vaqueros Reservoir would pass through the Los Vaqueros Pipeline, through the turbines of the Los Vaqueros Pumping-Generating Plant and into Kellogg Forebay. The enlarged reservoir also would have a connection to Contra Costa Water District?s existing pipeline. Kellogg Forebay water would be released to the Tuway Canal and flow by gravity to the California Aqueduct.

3.0 LAND USE

3.1 IMPACTS COMMON TO ALL EXAMPLE SITES

Short-term disruption of adjacent land use

Proposed construction activities would cause a short-term temporary disruption to land use adjacent to the project area. This impact would be significant and mitigable over the short term. The degree of disruption experienced during reservoir and dam construction would be directly related to the proximity of the reservoir location to nearby sensitive receptors, such as residences or agricultural land uses.

During reservoir and dam construction, local land uses and access to and around the project area would be temporarily disrupted. ~~The disruption to local land uses~~ Effects would include increased noise from operating heavy ~~excavation~~ construction equipment,

dust from earthwork, and increased truck traffic on local streets. The greatest disturbance from these factors would occur during the excavation phase of reservoir construction. Areas that would experience the greatest degree of disruption due to reservoir construction are the residences that live in the project vicinity within one-quarter mile of the construction right-of-way.

Constructing conveyance facilities also would have short-term but significant land use impacts within or adjacent to the construction right-of-way. Construction activities would be generally disruptive, and result in increased noise, dust, and truck traffic. This disruption and inconvenience would be temporary but would still be considered a potentially significant impact.

During construction of conveyance facilities, local land uses and access to and around the project area would be temporarily disrupted. ~~The disruption to local land uses~~ Effects would include increased noise from operating heavy ~~excavation~~ construction equipment, dust from earthwork, increased truck traffic on local streets, and potential utility disruption.

The proposed conveyance facilities and pumping plants would restrict these areas from future development. New reservoirs also would preclude future structures and most land uses on the sites other than open space and recreational use. These land use changes could potentially conflict with local plans for development in the project areas. Potential conflicts with planned development would be considered a significant land use impact.

3.2 EXAMPLE 1: SITES/COLUSA RESERVOIR PROJECT

3.2.1 Construction-related Impacts

Reservoir

Short-term disruption of adjacent land use
Areas that would experience the greatest degree of disruption due to reservoir construction are the residences in Mills Orchards and any other isolated residences in the surrounding area.

Tehama-Colusa Canal Enlargement

Short-term disruption of adjacent land use
The proposed project would require enlarging 24 siphons, crossing 58 roads, and constructing five new check structures (CALFED Storage and Conveyance Refinement Team 1997g). Although this area is sparsely populated, these activities may have a temporary but significant impact on traffic circulation and utility service in the project area during construction.

Tehama-Colusa Canal Extension

Short-term disruption of adjacent land use
Both the enlarged and parallel canal configurations and new canal would require modifications to numerous siphons, check structures, culverts, overchutes, bridges, and canal utilities. Some of the larger crossings required for the new canal include Oat Creek, Cache Creek, and Highway 16 (CALFED Storage and Conveyance Refinement Team 1997d). Traffic disruption and possibly street closure could occur where the proposed enlarged or parallel canal crosses roads.

Chico Landing Intertie

Short-term disruption of adjacent land use
Traffic disruption and possibly street closure could occur where the proposed canal crosses Southern Pacific Railroad and nine county roads.

3.2.1.1 Operation and Maintenance-related Impacts

Reservoir

Permanent land use changes
The proposed project facilities would consist of permanent structures (i.e., reservoir, dams, canal, and pumping plant) that would displace existing agricultural land, grassland, and rangeland. The proposed Sites/Colusa Reservoir, with a capacity of 3.3 MAF, would inundate approximately 28,500 acres. Assuming an approximate 60/40 percent surface area division between Colusa and Glenn Counties, respectively, approximately 17,100 acres of Colusa County would be inundated and 11,400 acres of Gleen County would be inundated. Assuming a 100-foot wide construction corridor, the proposed Logan Canal also could convert up to approximately 20 additional acres in Glenn County. However, only about 10 percent of the project site (approximately 1,300 acres) consists of agriculture land (namely, barley) (CALFED Storage and Conveyance Refinement Team 1997b). Therefore, the maximum acreage of agricultural land lost in Colusa County would be only 1,710 acres and the maximum acreage of agricultural land converted in Glenn County would be about 1,140 acres.

The lost acreage in Colusa County represents approximately 0.002 percent of the county?s land used for orchards and vineyards, cropland, and undeveloped rangeland (County of Colusa 1989). Converted land in Glenn County would represent approximately 0.001 percent of county land used for agricultural croplands and pasture (County of Glenn 1993). A portion of the area that would be inundated by the Sites/Colusa Reservoir also could affect prime farmland. Pursuant to the Glenn County General Plan, converting prime agricultural land to nonagricultural uses is considered an irreversible loss of resources and also is considered a significant impact under CEQA. Therefore, loss of this land would be considered a significant impact.

Although the project area is largely undeveloped, the project would displace the small community of Sites and possibly some other isolated residences or businesses in the project area. According to the Colusa County General Plan, Sites has about ten homes, a general store, and a town park (County of Colusa 1989). Displacement of residents or businesses not wanting to relocate is considered an unavoidable impact that cannot be mitigated to a less than significant level.

Conflicts with applicable land use plans of local jurisdictions
The proposed Logan Forebay, Logan Canal, Logan Pumping-Generating Plant, Logan and Hunters Dams, and nine saddle dams would be in Glenn County and the proposed Golden Gate Dam and Sites Dam would be in Colusa County. The Sites/Colusa Reservoir would be bisected by the Glenn-Colusa County line.

Project facilities in Glenn County would be on land designated Foothill Agriculture/Forestry in the Glenn County General Plan with corresponding zoning designations of Foothill Agricultural/Forestry, Timberland Preserve, Agricultural Preserve, and Open Space (County of Glenn 1993). Examples of uses that are considered appropriate under the Foothill Agriculture/Forestry land use designation include, but are not limited to; grazing, growing and harvesting timber, growing and harvesting agricultural crops, and hunting lodges, clubs, and camps.

Project facilities in Colusa County would be on land designated Agriculture-General, Agriculture-Upland, and Rural Service Center (around the community of Sites) in the Final Colusa County General Plan (County of Colusa 1989). Land designated Agriculture-General is typically used for orchard and crop production and is zoned as Exclusive Agriculture. Agriculture-Upland land is primarily used for cattle and sheep grazing and is intermixed with undeveloped uninhabited forests, chaparral, and grasslands. The Rural Service Center designation means that Sites is a small, predominantly residential settlement where growth potential is severely limited by a lack of urban services.

Glenn County or Colusa County zoning or general plan designations in this area may need to be changed or a conditional use permit granted to ensure consistency between proposed development and planned land uses.

Road and utility relocations
The proposed project would require relocating local roads such as Sites-Lodoga Road, Huffmaster Road, and Peterson Road outside the reservoir footprint. Utilities also may need relocation. Although this area is sparsely populated, relocating roadways and possibly utilities would have a temporary but significant impact on traffic circulation and utility service in the project area.

Reduced potential for local flooding
Operating the proposed reservoir and dams would decrease flows in downstream tributaries during spring snowmelt season. These facilities would reduce local flooding for lands around the community of Maxwell as well as in the Colusa Basin (CALFED Storage and Conveyance Refinement Team 1997b). This is a beneficial effect of the project and no mitigation would be required.

Tehama-Colusa Canal Enlargement

Permanent land use changes
The proposed project facilities would consist of permanent canal structures that would displace agricultural land uses adjacent to the existing canal. Approximately 26 miles of the Tehama-Colusa Canal Enlargement project would be in Tehama County, approximately 37 miles would be in Glenn County, and the remaining four miles would be in Colusa County. However, only 60 percent of property adjacent to the existing canal is agricultural land (CALFED Storage and Conveyance Refinement Team 1997g).

Assuming a worst case 500-foot wide construction right-of-way for the parallel canal configuration, approximately 945 acres in Tehama County, 1,345 acres in Glenn County, and 145 acres in Colusa County could be converted from agricultural to nonagricultural use. Converted land in Tehama County would represent about 0.0008 percent of county land in agricultural production (County of Tehama 1983). Converted land in Glenn County would represent approximately 0.002 percent of county land used for agricultural croplands and pasture (County of Glenn 1993). The lost acreage in Colusa County represents approximately 0.0002 percent of county land used for orchards and vineyards, cropland, and undeveloped rangeland (County of Colusa 1989).

A portion of the area converted by the enlarged or parallel canal configurations could be prime farmland. Pursuant to the Glenn County General Plan, converting prime agricultural land to nonagricultural uses is considered an irreversible loss of resources and also is considered a significant impact under CEQA. Therefore, loss of this land would be considered a significant impact.

Although the project area is largely undeveloped, the project could displace isolated residences or businesses within the construction corridor. Displacement of residents or businesses not wanting to relocate is considered an unavoidable impact that cannot be mitigated to a less than significant level.

Conflicts with applicable land use plans of local jurisdictions
The proposed enlarged or parallel canal would restrict this area from future development. These land use changes could potentially conflict with local plans for development in the project area. Potential conflicts with planned development would be considered a significant land use impact.

The portion of the project in Tehama County is on land designated for cropland, grazing, and

rural-residential small lot (in the vicinity of Proberta and Corning) in the Tehama County General Plan and Land Use Maps (County of Tehama 1983).

The majority of the canal that traverses Glenn County is on land designated Intensive Agriculture in the Glenn County General Plan with corresponding zoning designations of Exclusive Agriculture (minimum 40 and 80 acre parcels) and Agricultural Preserve (County of Glenn 1993). Examples of uses that are considered appropriate under the Intensive Agriculture land use designation include, but are not limited to; growing and harvesting field crops, grain, and hay crops, pasture, and grazing land. Other General Plan land use designations along the canal in the northern portion of the county in the vicinity of Orland and Greenwood include General Agriculture, Rural and Suburban Residential, Industrial, and Service Commercial.

The portion of the canal in Colusa County is on land designated Agriculture-General in the Final Colusa County General Plan (County of Colusa 1989). Land designated Agriculture-General is typically used for orchard and crop production and is zoned as Exclusive Agriculture.

Tehama County, Glenn County, or Colusa County zoning or general plan designations in the project area may need to be changed or a conditional use permit granted to ensure consistency between proposed development and planned land uses.

Tehama-Colusa Canal Extension

Permanent land use changes
The proposed project facilities would consist of permanent canal structures that would displace existing agricultural land uses adjacent to the canal. Approximately 38 miles of the enlarged Tehama-Colusa Canal (Reaches 6, 7, and 8) would be in Colusa County and approximately six miles would be in Yolo County. The entire length of the proposed 21-mile Tehama-Colusa Extension Project would be in Yolo County. However, only 60 percent of property adjacent to the existing canal is agricultural land (CALFED Storage and Conveyance Refinement Team 1997d).

Assuming a 500-foot wide construction corridor for the parallel canal configuration, about 1,380 acres in Colusa County and 220 acres in Yolo County could be converted from agricultural to nonagricultural use. Assuming a 300-foot right-of-way, the proposed canal extension could convert an additional 460 acres in Yolo County from agricultural to nonagricultural use.

The lost acreage in Colusa County would represent approximately 0.002 percent of the county?s land used for orchards and vineyards, cropland, and undeveloped rangeland (County of Colusa 1989). Converted land in Yolo County would represent approximately 0.001 percent of county land used for agricultural croplands and pasture (County of Yolo 1983).

A portion of the area converted by the parallel canal configurations and canal extension project could be prime farmland. Converting prime agricultural land to nonagricultural uses is considered an irreversible loss of resources and also is considered a significant impact under CEQA. Therefore, loss of this land would be considered a significant impact.

Although the project area is largely undeveloped, the project could displace isolated residences or businesses within the construction corridor. Displacement of residents or businesses not wanting to relocate is considered an unavoidable impact that cannot be mitigated to a less than significant level.

Conflicts with applicable land use plans of local jurisdictions
The proposed enlarged or parallel canal and new canal would restrict these areas from future development. These land use changes could potentially conflict with local plans for development in the project area. Potential conflicts with planned development would be considered a significant land use impact.

The majority of the canal that traverses Colusa County is on land designated Agriculture-General in the Colusa County General Plan (County of Colusa 1989). Land designated Agriculture-General is typically used for orchard and crop production and is zoned as Exclusive Agriculture. The portion of the existing and new canal in Yolo County would be on land designated Valley Lands, Foothill Lands, and Watershed in the Yolo County General Plan?s Master Plan of Land Use (Yolo County 1983). The Colusa and Yolo County zoning or general plan designations in this area may need to be changed or a conditional use permit granted to ensure consistency between proposed development and planned land uses.

Chico Landing Intertie

Permanent land use changes
The proposed Chico Landing Intertie would consist of permanent structures (i.e., canals, pumping plants, and a diversion structure on the Sacramento River) that would displace existing agricultural land uses. The proposed route of the canal would traverse approximately 11 miles of mainly agricultural land, of which 2.5 miles are considered prime farmland (County of Glenn 1993, 1970). Assuming a 100-foot wide construction corridor, this project could convert up to approximately 130 acres of agricultural land to nonagricultural use, including 30 acres of prime farmland.

This lost acreage represents only 0.0002 percent of Glenn County?s 1,317 square miles used for agricultural croplands and pasture and about 0.0001 percent of the county?s prime farmland. However, according to the Glenn County General Plan, converting prime agricultural land to nonagricultural uses is considered an irreversible loss of resources. In addition, pursuant to the CEQA Guidelines, Appendix G, converting prime agricultural land to nonagricultural use or impairing the productivity of prime agricultural land is considered a significant impact. Therefore, loss of this land is considered a significant impact.

Conflicts with applicable land use plans of local jurisdictions
The proposed canal and pumping plants would restrict these areas from future development. These land use changes could potentially conflict with local plans for development in the project area. Potential conflicts with planned development would be considered a significant land use impact.

The proposed intertie facilities would be in Glenn County on land designated Intensive Agriculture with corresponding zoning designations of Exclusive Agricultural Zone (minimum 40 and 80 acre parcels) and Agricultural Preserve Zone (Glenn County 1993). Examples of uses that are considered appropriate under the Intensive Agriculture land use designation include, but are not limited to; growing and harvesting field crops, grain, and hay crops; growing and harvesting fruit and nut trees, vines, and vegetables; pasture and grazing land; and animal raising operations. Glenn County zoning or general plan designations in this area may need to be changed or a conditional use permit granted to ensure consistency between proposed development and planned land uses.

3.3 EXAMPLE 2: THOMES-NEWVILLE RESERVOIR PROJECT

3.3.1 Construction-related Impacts

Short-term disruption of adjacent land use
Areas that would experience the greatest degree of disruption due to project construction are residents in the nearby community of Paskenta, approximately two miles north of the proposed Newville Reservoir.

Constructing the four conveyance canals also would have short-term but significant land use impacts within or adjacent to the construction right-of-way. The Sour Grass Canal would require crossing Interstate 5, the Tehama Colusa Canal, and the Southern Pacific Railroad. Construction activities would be generally disruptive, and result in increased noise, dust, and truck traffic. The project area is sparsely populated with few structures, and this disruption and inconvenience would be temporary. However, nearby recreationists at Black Butte Reservoir may be temporarily inconvenienced, particularly during construction of the Tehenn Canal, Black Butte Pumping-Generating Plant, and Black Butte Canal, and this would still be considered a potentially significant impact.

3.3.2 Operation and Maintenance-related Impacts

Permanent land use changes
The proposed project facilities would consist of permanent structures (i.e., reservoirs, dams, canals, and pumping plants) that would displace existing land uses. The proposed Newville Reservoir, with a capacity of 3.08 MAF, would inundate approximately 16,700 acres. Assuming a 100-foot wide construction corridor, the proposed Tehann, Black Butte, and Sour Grass canals also could displace up to approximately 170 acres of land. Vegetation in the project area consists primarily of grasslands, oak-pine woodland, and chaparral, along with some riparian vegetation (CALFED Storage and Conveyance Refinement Team 1997e). Therefore, there would be no direct loss of agricultural land and no significant long-term impact to agricultural land uses.

Although the project area is largely undeveloped, the project may displace a few isolated residences or businesses in the Glenn County unincorporated areas of Newville and Chrome that are within the footprint of the proposed Newville Reservoir. Displacement of residents or businesses not wanting to relocate is considered an unavoidable impact that cannot be mitigated to a less than significant level.

Conflicts with applicable land use plans of local jurisdictions
The proposed Sour Grass Canal, Sour Grass Generating Plant, Black Butte Pumping-Generating Plant, Tehenn Canal, and Thomes Creek Diversion Canal would be in Tehama County and the proposed Tehenn Reservoir would be in Glenn County. The Tehenn Pumping-Generating Plant and Newville Reservoir would be bisected by the Tehama-Glenn County line.

Project facilities in Glenn County would be on land designated Foothill Agriculture/Forestry in the Glenn County General Plan with corresponding zoning designations of Foothill Agricultural/Forestry, Timberland Preserve, Agricultural Preserve, and Open Space (Glenn County 1993). Examples of uses that are considered appropriate under the Foothill Agriculture/Forestry land use designation include, but are not limited to; grazing, growing and harvesting timber, growing and harvesting agricultural crops, and hunting lodges, clubs, and camps. Project facilities in Tehama County would be on land designated Cropland and Grazing in the Tehama County General Plan (County of Tehama 1983).

Glenn County and Tehama County zoning or general plan designations in this area may need to be changed or a conditional use permit granted to ensure consistency between proposed development and planned land uses.

Road relocations
The proposed project would require relocating approximately eight miles of public roads within the Newville Reservoir inundation area, including a portion of Paskenta-Round Valley Road that passes through the north end of the reservoir. The proposed project also would require about 10 miles of new road construction (CALFED Storage and Conveyance Refinement Team 1997e). Although this area is sparsely populated, relocating and constructing new roadways would have a temporary but significant impact on traffic circulation in the project area.

Reduced potential for local flooding
Operating the proposed reservoirs and dams would decrease flows in downstream tributaries during spring snowmelt season. These facilities would reduce local flooding for farmlands and other downstream users. This is a beneficial effect and no mitigation would be required.

3.4 EXAMPLE 3: WEST SAN JOAQUIN VALLEY RESERVOIR PROJECT

3.4.1 Construction-related Impacts

Short-term disruption of adjacent land use
Areas that would experience the greatest degree of disruption due to project construction are recreationists at nearby San Luis Reservoir and Los Banos Creek State Recreation Areas.

Constructing two conveyance channels also would have short-term but significant land use impacts within or adjacent to the construction right-of-way. Conveyance Channel No. 1 would require a bridge structure to cross Interstate 5 and Canyon Creek (CALFED Storage and Conveyance Refinement Team 1997a). Construction activities would be generally disruptive, and result in increased noise, dust, and truck traffic. Conveyance Channel No. 1 would pass through the Los Banos Creek State Recreation Area. This disruption and inconvenience would be temporary but would still be considered a potentially significant impact.

3.4.2 Operation and Maintenance-related Impacts

Permanent land use changes
The proposed reservoir, dams, conveyance facilities, and pumping-generating plants would be permanent structures that would displace existing uses, mostly nonirrigated pasture used as grazing land for cattle and sheep (Department of Water Resources 1990). The reservoir itself would inundate approximately 13,810 acres.

Although the project area is largely undeveloped pasture and rangeland, the project may displace seven ranches and fewer than 50 people (Department of Water Resources 1984). Displacement of residents not wanting to relocate is considered an unavoidable impact that cannot be mitigated to a less than significant level.

Conflicts with applicable land use plans of local jurisdictions
The proposed project facilities would be in Merced County on land designated Foothill-Pasture in the Merced County General Plan and zoned A-2, Exclusive Agriculture (Stone 1997). Zoning or general plan designations in this area may need to be changed or a conditional use permit granted to ensure consistency between proposed development and planned land uses.

Road and utility relocations
The proposed project would require relocating existing roads and utilities in the project area, which could temporarily disrupt traffic and utility service. The proposed project would require relocating or reconstructing 12.5 miles or roads and constructing approximately 20 miles of new roads for recreation and facilities access. Utilities in the project area would be potentially disrupted as a result of trenching and excavation for channel and other facility construction. Utilities that would need to be relocated include a 500 kV PG&E transmission line, one 20-inch and one 16-inch crude oil pipeline, and one 26-inch natural gas pipeline (CALFED Storage and Conveyance Refinement Team 1997a).

Reduced potential for local flooding
Operating the proposed reservoir and dams would decrease flows in downstream tributaries during spring snowmelt seasons. These facilities would reduce local flooding potential to a level above that required for the Probable Maximum Flood as defined by the US Army Corps of Engineers for farmlands adjacent to Los Banos Creek and for the community of Los Banos (CALFED Storage and Conveyance Refinement Team 1997a), approximately 11 miles downstream of the proposed reservoir. This is a beneficial effect and no mitigation would be required.

3.5 EXAMPLE 4: MONTGOMERY RESERVOIR PROJECT

3.5.1 Construction-related Impacts

Short-term disruption of adjacent land use
Areas that would experience the greatest degree of disruption due to reservoir construction are the residences in Snelling and the surrounding area.

Constructing the new discharge and Main Canal pipelines also would have short-term but significant land use impacts within or adjacent to the construction right-of-way. Construction activities would be generally disruptive and would result in increased noise, dust, and truck traffic and possible street closure where the Main Canal pipeline crosses Merced Falls Road. This disruption and inconvenience would be temporary but would still be considered a potentially significant impact. Although construction impacts would be significant in the short term, land above the proposed Main Canal and discharge pipelines would be restored to its original use after construction and no long-term significant land use impacts would result.

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3.5.2 Operation and Maintenance-related Impacts

Permanent land use changes
The proposed reservoir, dams, and pumping plant would be permanent structures that would displace existing uses through inundation of approximately 8,050 acres. Although the project area is largely undeveloped rangeland, the project may displace a few isolated residences (Stone 1997). Displacement of residents not wanting to relocate is considered an unavoidable impact that cannot be mitigated to a less than significant level.

Conflicts with applicable land use plans of local jurisdictions
The proposed project facilities would be in Merced County on land designated Foothill-Pasture in the Merced County General Plan and zoned A-2, Exclusive Agriculture (Stone 1997). Zoning or general plan designations in this area may need to be changed or a conditional use permit granted to ensure consistency between proposed development and planned land uses.

Road and utility relocations
The proposed project would require relocating County Road 59J and a telephone line (CALFED Storage and Conveyance Refinement Team 1997f). Other utilities in the project also could be potentially disrupted or relocated as a result of trenching and excavation for pipeline and reservoir construction. This is considered a significant and mitigable land use impact.

Reduced potential for local flooding
Operating the proposed reservoir and dams would decrease flows in downstream tributaries during spring snowmelt seasons, reducing potential for local flooding and increasing flood protection to Snelling and surrounding partially developed areas (e.g., Four Corners and Hopeton). This is a beneficial effect of the project and no mitigation would be required.

3.6 EXAMPLE 5: LOS VAQUEROS RESERVOIR ENLARGEMENT PROJECT

3.6.1 Construction-related Impacts

Short-term disruption of existing land uses
Areas that would experience the greatest degree of disruption due to reservoir construction are any isolated residences in the surrounding area and nearby recreational users at Mount Diablo State Park.

3.6.2 Operation and Maintenance-related Impacts

Permanent land use changes
The majority of the project area is used for grazing, dryland farming, and other agricultural practices (Contra Costa Water District et al. 1993). The proposed reservoir and Kellogg Forebay would be permanent structures that would displace existing uses through inundation of approximately 4,954 acres. Other proposed structures that would displace existing land uses include the pumping-generating plants, Tuway Canal, widened North San Joaquin Intake Channel, and Kellogg Pumping Plant Discharge Facility.

Constructing these facilities could result in permanent conversion of agricultural or grazing land in the project area. The project may also displace a few isolated residences. Displacement of residents not wanting to relocate is considered an unavoidable impact that cannot be mitigated to a less than significant level (Contra Costa Water District et al. 1993).

Conflicts with applicable land use plans of local jurisdictions
The proposed project facilities would be in Contra Costa County on land designated Agricultural Lands, Agricultural Core, Public-Semi Public, Delta Recreation and Resources, and Watershed (Contra Costa Water District et al. 1993). The primary purpose of the Agricultural Lands designation is to preserve and protect lands well suited for food, fiber, and plant material production. The Agricultural Core designation is intended to preserve and protect the most desirable farming lands in the county. A wide variety of public and private uses are allowed on lands designated Public-Semi Public such as libraries, fire stations, and schools. Allowable uses on Delta Recreation and Resources land are primarily agricultural. The Watershed designation is applied to lands associated with reservoirs used for domestic water supply. Contra Costa County zoning or general plan designations in this area may need to be changed or a conditional use permit granted to ensure consistency between proposed development and planned land uses.

Road and utility relocations
The proposed project could require relocation of Vasco Road and could change circulation in the project area. Utilities in the project area also could be potentially disrupted or relocated as a result of trenching and excavation for project construction. This is considered a significant and mitigable land use impact.

Reduced potential for local flooding
Operating the proposed reservoir and dams would decrease flows in downstream tributaries during spring snowmelt season, reducing the potential for local flooding and increasing flood protection to downstream areas. This is a beneficial effect of the project and no mitigation would be required.

3.7 MITIGATION STRATEGIES

The following strategies are grouped according to the identified impact and are applicable to all projects unless otherwise noted.

Mitigation for Impacts Related to Short-term Disruption of Adjacent Land Use

Provide advance notice of the construction activities schedule to affected community members (e.g., residences, property owners, schools, and businesses);

Coordinate with the applicable jurisdiction to obtain necessary permits and assign an inspector to oversee construction activities; and

During construction, maintain access to homes, schools, and businesses, and provide adequate signage for detours.

Mitigation for Impacts Related to Permanent Land Use Changes

If applicable and where feasible, schedule construction activities in a manner so that current crops may be harvested prior to construction initiation. Pay fair market value for any crops destroyed or taken out of production on private or leased lands as a result of project construction;

If necessary, compensate property owners for the value of their land and associated improvements, including dwelling units, in compliance with state regulations for providing relocation assistance to displaced persons or businesses;

If necessary, aid in locating alternative dwelling units for displaced persons pursuant to the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970;

Where applicable (e.g., Montgomery and Los Vaqueros Reservoir Projects), compensate property owners for acquisition of permanent and construction easements for proposed pipelines; and

Where applicable, minimize the amount of permanent easement required for pipeline construction and select easement locations in consultation with property owners to minimize property disruption and fragmentation.

Mitigation for Impacts Related to Conflicts with Applicable Land Use Plans of Local Jurisdictions

Coordinate with the applicable jurisdiction regarding future plans for projects in the area. Coordinate project design and construction with other planned projects to the greatest extent possible to avoid design conflicts and minimize construction disruption.

Coordinate with the applicable jurisdiction and apply for a zoning or general plan change, if necessary.

Mitigation for Impacts Related to Road and Utility Relocations

If applicable and where feasible, relocate roads and utilities prior to project construction to ensure continued access and utility service through the project area.

Prepare a detailed engineering and construction plan as part of the project?s design plans and specifications and include procedures for rerouting roads and excavating, supporting, and filling areas around utility cables and pipes in this plan.

Notify all affected persons in the project area of the construction plans and schedule. Make arrangements with residents and businesses regarding road detours and protection, relocation, or temporary disconnection of utility services.

Verify utility locations through consultation with appropriate entities and field surveys (e.g., probing and potholing).

Promptly reconnect disconnected cables and lines.

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