

Cultural Resources are defined in this chapter as prehistoric and historic archaeological resources, architectural/built-environment resources, places important to Native Americans and other ethnic groups, and human remains. This chapter assesses potential effects of the action alternatives on cultural resources and identifies mitigation measures to reduce or eliminate effects on those resources in the study area (the area in which impacts may occur), which is limited to the Plan Area (the area covered by the BDCP). This includes portions of the Sacramento-San Joaquin Delta (Delta), Suisun Marsh, and Yolo Bypass. As necessary, additional site-specific studies and analyses will be conducted pursuant to CEQA, NEPA, and Section 106 of the National Historic Preservation Act (NHPA) as part of the second tier environmental review for the program-level components of the selected alternative pursuant to mitigation measures identified in this chapter.

This chapter first provides an overview of the methods used to identify the kind and density of cultural resources in the Plan Area (i.e., the statutory Delta, the Suisun Marsh, and the Yolo Bypass). Following the methods discussion is a description of the environmental setting/affected environment as it pertains to the types of cultural resources that occur in the Delta region, including a subsection that describes sensitivity for previously unidentified archaeological resources in the Plan Area. The chapter then describes the regulatory framework that governs cultural resources in the context of BDCP implementation and the analysis of effects, and describes the anticipated effects of the BDCP. Where specific effects associated with alternatives are analyzed in detail, the chapter refers to the “study area;” i.e., the area in which discrete effects on cultural resources associated with the alternatives may occur.

18.1 Environmental Setting/Affected Environment

18.1.1 Methods for Resource Identification

A number of standard methods such as record searches and site visits were used to determine the types and location of known cultural resources that could be affected by BDCP alternatives. Record searches were conducted and aerial photography was used for the entire study area. In addition, surveys were conducted in accessible areas. More specifically, the following methods were used to assess the kind and number of cultural resources that could be affected by the action alternatives and conservation measures:

- Archival map research to identify overall sensitivity for historic-era resources as well as locations of built resources of at least 45 years of age (resources 45-years old are being identified to avoid duplicative efforts if some project elements are not implemented within the next 5 years).
- Field surveys for built-environment resources that were accessible from the public right of way (approximately 67% of the right of way was covered), designed to evaluate identified and previously unidentified built-environment resources.

- 1 ● Records searches to identify recorded cultural resources (including searches of NRHP and CRHR
2 eligibility).
- 3 ● A sensitivity analysis for unidentified resources historic-era and prehistoric archaeological
4 resources (based on the density of recorded resources, geology and geological processes, and
5 historic activity, included in Appendix 18A, *Archaeological Resources Sensitivity Assessment*).
- 6 ● Archaeological surveys designed to confirm known resource locations for parcels that were
7 legally accessible (approximately 5 percent of the right-of-way was covered—less than the
8 percentage of the footprint covered in the built environment field studies because in some
9 instances, visible built-environment resources such as structures and residences can be
10 photographed from public roads or viewed from aerial sources).
- 11 ● Review of built-environment resources using aerial photography sources such as Google Earth
12 and Google Maps.
- 13 ● Correspondence with Native American contacts provided by the Native American Heritage
14 Commission (NAHC) and a search of the sacred lands database maintained by the NAHC.

15 These data were compiled to provide an overview of the potential for the alternatives to result in
16 significant effects on cultural resources. These data, as well as the prehistoric, ethnographic, and
17 historic setting for the region, were used to identify the suite of cultural resource property types
18 that may be affected by the alternatives. Specific effects associated with the alternatives and
19 conservation measures are described below under Section 18.3.3, *Effects and Mitigation Approaches*.

20 For numerous practical reasons, however, not all potential cultural resources in the study area could
21 be identified. A primary reason is the fact that, in order to evaluate whether particular sites were
22 “historical resources” for “unique archeological resources,” invasive and even destructive
23 techniques would have had to be used. Another factor was the sheer size of the study area, which
24 made it impossible to evaluate every potential resource within any reasonable timeframe and at any
25 reasonable cost. Moreover, the professional cultural resource specialists concluded that reasonable
26 samples, combined with record searches and analyses of aerial photographs, would allow them to
27 sufficiently characterize the nature of the resources and the likely effect within the footprint of the
28 BDCP alternatives. In addition, every effort is made to avoid and minimize effects on significant
29 cultural resources, including historic properties and historical resources. Finally, much of the Plan
30 Area—particularly portions that could be affected by BDCP alternatives—was not legally
31 accessible.¹ (For a detailed discussion of DWR’s efforts to obtain legal access to inaccessible portions
32 of the Plan Area, see Appendix 4A, *Summary of Survey Data Collection by Department of Water
33 Resources to Obtain Information Regarding Baseline Conditions in Areas That Could Be Affected by
34 BDCP*).

35 **18.1.1.1 Archival and Map Research**

36 Historic map research was conducted at the Earth Sciences and Map Library at the University of
37 California, Berkeley, October 10–12, 2011, and copies of all historic topographic maps within the
38 boundaries of the Plan Area were obtained. Features identified on these maps have been compared
39 with the footprint of action alternatives to identify the sensitivity of each alignment for historic-era
40 cultural resources.

¹ (*In Re Department of Water Resources Cases, JCCP Action No. 4594, Final Order April 8, 2011*).

1 In addition, the records of identified shipwrecks retained by the California State Lands Commission
2 were compared with the footprint of all alternatives. Two plotted shipwrecks coincide with
3 proposed project features. The latitude and longitude on record place the resources on dry land
4 rather than within water features, therefore the locations of these resources are likely incorrect and
5 it is not likely that the action alternatives will affect these resources.

6 **18.1.1.2 Records Searches**

7 Records searches were conducted through the relevant information centers of the California
8 Historical Resources Information System (CHRIS). These searches revealed that a wide variety of
9 prehistoric- and historic-era sites, features, and artifacts have been documented in the Plan Area.
10 These cultural resources include early Native American burial, habitation, and mound sites; gold
11 rush-era residences; ranches; agricultural work camps and landscapes; railroads; water conveyance
12 systems; levees; rural residences; rural communities; small and medium cities; rural historic
13 landscapes; and bridges.

14 Some of these resources have been evaluated for the NRHP and CRHR eligibility criteria, but the
15 majority remains unevaluated either because they are inaccessible or because destructive test
16 excavation is not currently feasible. Based on available records, many of these resources appear
17 likely to qualify as historical resources and historic properties. While the CRHR and NRHP were
18 checked during the record search because many of these sites are very old and have not been
19 revisited after initial documentation, they have not been previously evaluated for the NRHP or CRHR
20 in earlier studies.

21 Identified resources were mapped with geographic information systems (GIS), and their locations
22 were compared to the footprint of the alternatives.

23 **18.1.1.3 Field Surveys**

24 **Initial Site Visits**

25 Where access was available, cultural resource site visits were first conducted in 2009 to confirm the
26 location of known resources. Site visits were conducted over 6 days: May 19–21, September 21,
27 October 27, and December 7, 2009 to confirm the location of previously documented resources.
28 Documentation focused on photographing previously identified resources and recording locations
29 using global positioning system (GPS) units. This effort focused on archaeological resources that
30 were legally accessible. In addition, cultural resources surveys were conducted from May to August
31 2011 to confirm additional archaeological resources where access became available. Attempts were
32 made to verify the location of previously recorded sites in the Plan Area. Surveys of some of the
33 recorded sites were completed. However, litigation in 2010 restricted DWR's ability to access all
34 sites that could have been relevant to this analysis. This prohibition remains in effect for numerous
35 properties as of the time of this Draft EIR/EIS. The majority of the sites revisited in 2009 and 2011
36 were in the southern and western portions of the Plan Area.

37 **Field Surveys for Built-Environment Resources**

38 Appendix 18B enumerates identified built environment resources affected by the BDCP alternatives.
39 Field surveys were performed in May and June of 2012 for those portions of the conveyance facility
40 alternative alignments that could be viewed from public roads and accessible rights-of-way locations.
41 Prior to surveys, background research was conducted for built-environment resources that required

1 inventory and evaluation using records of previously recorded resources, topographic maps, aerial
2 photographs, and the date of construction. Where access to a given resource was available and
3 sufficient data could be collected, its eligibility for listing in the National Register of Historic Places
4 and California Register of Historical Resources was assessed. Where dense tree cover, recent
5 structures, or landscaping obscured built environment resources, they were not evaluated. In
6 addition, some large rural properties that contain many built resources were not evaluated because
7 contributing structures that form part of the setting, and thus integrity of the resource could not be
8 accessed for documentation. Appendix 18B summarizes identified built-environment resources and
9 effect mechanisms (such as specific BDCP project features or activities that may potentially affect
10 existing built-environment resources). In addition effect mechanisms are described in Section
11 18.3.2.,.

12 **Field Surveys for Archaeological Resources**

13 Appendix 18B enumerates identified archaeological resources affected by the BDCP alternatives.
14 Following initial site visits, archaeological sites were visited where legally accessible, to update the
15 site record forms and confirm the general nature and boundaries of the resource in June of 2012.
16 Archaeological sites were not individually evaluated based on field survey data because such
17 evaluation typically requires subsurface test excavation to retrieve a suitable sample of material,
18 which is potentially damaging. Excavation of samples from archaeological sites is typically necessary
19 for evaluation because the surface distribution of material provides only some indication of the
20 nature and boundaries of the deposit. Layered deposits may have material from different time
21 periods that are not visible from the surface. Test excavation retrieves a sample of such material to
22 characterize the site and to demonstrate why the site does or does not have significance within the
23 meaning of CRHR and National Register of Historic Places (NRHP) eligibility criteria described
24 below in the regulatory setting. In addition, where a deposit has been disturbed through natural or
25 human processes, the site may not have sufficient integrity to convey this significance. Subsurface
26 testing or excavation may be needed to further assess the significance of a cultural resource for
27 eligibility or listing on the NRHP or CRHR.

28 Subsurface test excavation is considered potentially damaging both within the professional practice
29 of archaeology and among the Native American community. Professional archaeologists consider
30 test excavation destructive because it can only be performed once. After a portion of a deposit has
31 been disturbed, the original spatial relationships between buried artifacts can never be perfectly
32 restored for re-examination. In addition, because science improves over time, archaeologists assume
33 that some data is always irretrievably lost during current excavations. Relative to future advances in
34 science; current excavations destroy the possibility of retrieving information that cannot currently
35 be analyzed based on available technology. In addition, the Native American community typically
36 objects to excavation of prehistoric sites because many sites in the study area contain human
37 remains that embody cultural and religious values. Test excavation may damage these remains, with
38 the potential for inadvertent damage.

39 For the analysis of effects under CEQA and NEPA, the potential damage to archaeological resources
40 associated with test excavation does not sufficiently justify the information gained prior to the
41 selection of an alternative for construction, as noted earlier. Test excavation of all resources for all
42 alternatives would result in potential damage and disturbance before project-related effects are
43 certain to occur. While individual archaeological sites cannot be completely evaluated without test
44 excavation, suitable proxy measures offer means of assessing the potential of the various
45 conveyance alignments to result in significant impacts on CRHR and NRHP eligible resources as well

1 as unique archaeological sites. These proxy measures consist of analyzing the density and
2 distribution of recorded resources, and estimating the nature and size of identified sites based
3 surface observations. This approach allows for subsequent assessment of the potential of the
4 alternatives to result in adverse effects on archaeological resources that are likely to qualify for the
5 CRHR or NRHP without physical destruction of the sites.

6 All parcels that were legally accessible were surveyed for archaeological resources. Of the 49,224
7 acres of the constructability footprint (including the PTO, West, East, and SCO options), 2,231 acres
8 were surveyed (4.53%). Parcels were walked in traditional transects, with archaeologists spaced no
9 more than 20 meters apart at any time. Visibility of the ground surface varied significantly, from
10 excellent visibility to near zero where high grasses made visibility difficult. Identified resources
11 were recorded on California Department of Parks and Recreation forms and surface boundaries
12 were mapped.

13 **18.1.1.4 Native American Correspondence**

14 The NAHC was contacted on May 21, 2009, and May 5, 2011, for information about the location of
15 known heritage or sacred sites in the Plan Area. The NAHC responded and provided a list of Native
16 American individuals and organizations that may have knowledge of cultural resources in the Plan
17 Area. DWR Staff archaeologists sent letters to the parties identified by the NAHC on June 15 and 22,
18 2009, requesting information regarding resources that may occur in the Plan Area. Updated letters
19 were sent on January 28, 2012 and follow-up phone calls were placed on July 26, 2012.

20 The NAHC indicated that the sacred lands file does not contain any mapped resources in the Plan
21 Area. In addition, representatives of the following Native American organizations also responded
22 and indicated that there were no objections or concerns about the BDCP at that time, but wished to
23 be kept apprised of future progress on the project: Wintun Environmental Protection Agency;
24 Cortina Indian Rancheria (CIR); Rumsey Indian Rancheria; and the United Auburn Indian
25 Community of Auburn Rancheria. No additional comments have been received to date.

26 **18.1.1.5 Geomorphology**

27 Archaeologists analyzed the geomorphology of the landscapes associated with the action
28 alternatives as a means of identifying relatively level and stable geomorphic surfaces that are
29 particularly sensitive for habitation. Such surfaces include alluvial fans and stream terraces located
30 near water, which are attractive places for habitation and subsistence activity, and may contain both
31 buried and surface archaeological sites. This information was used to assess the sensitivity of the
32 Plan Area for unidentified and buried cultural resources. This analysis indicates that the Plan Area
33 contains numerous landforms where buried prehistoric archaeological sites may be preserved. This
34 analysis is summarized in Appendix 18A, *Archaeological Resources Sensitivity Assessment*.

35 **18.1.2 Prehistoric Archaeological Setting**

36 The Plan Area is located in the Central Valley, which is divided into two major physiographic
37 provinces separated by the Delta. The Sacramento Valley, drained by the southward-flowing
38 Sacramento River, lies to the north, and the San Joaquin Valley, drained by the northward-flowing
39 San Joaquin River, lies to the south. The presence of this fresh water created one of the most diverse
40 and productive environmental zones in California (Rosenthal et al. 2007: 147).

1 Although various peoples dwelled in the area now known as the Central Valley (to be discussed
2 further in Section 18.1.4, *Ethnographic Setting*) and spoke a variety of languages, common linguistic
3 roots indicate that these groups had a related history and regular interaction (Rosenthal et al. 2007:
4 149). A shared heritage is also indicated by common technological, economic, ceremonial, and
5 sociopolitical characteristics described by twentieth-century anthropologists who identified the
6 Central Valley as the core of the California Culture area (Kroeber 1936, 1939).

7 Early inhabitants of the Central Valley used the various habitats found throughout the valley,
8 including riparian forest, marsh, alkali basins, oak savanna, and foothill woodland communities.
9 They created a sophisticated material culture and established a trade system involving a wide range
10 of manufactured goods from distant and neighboring regions, and their population and villages
11 prospered in the centuries prior to historic contact (Rosenthal et al. 2007:147, 149).

12 Over time, however, the majority of surface sites in the Central Valley, many mounds, have been
13 destroyed by agricultural development, levee construction, and river erosion. Many excavations of
14 Central Valley sites in the early twentieth century were performed by untrained individuals as well
15 as professionals with rudimentary methods, who focused on artifact and burial recovery but paid
16 little attention to other artifacts such as dietary remains and technological features, thus hampering
17 modern attempts at reanalysis. Early professional efforts emphasized culture history rather than
18 processes that drive culture change. Additionally, the Central Valley's archaeological record has
19 been affected by the natural processes of landscape evolution: surface sites are embedded in young
20 sediments set within a massive and dynamic alluvial basin, while most older archaeological deposits
21 have been obliterated or buried by ongoing alluvial processes. Consequently, archaeologists are
22 challenged to identify and explain long-term culture change in portions of the Central Valley where
23 the majority of the available evidence spans only the past 2,500 years (or, in rare cases, the past
24 5,500 years) (Rosenthal et al. 2007:150).

25 There is no single cultural-historical framework that accommodates the entire prehistoric record of
26 the Central Valley. Moratto's (1984) well-regarded synthesis of Central Valley archaeology was
27 based on works from Bennyhoff and Fredrickson (Elsasser 1978; Fredrickson 1973, 1974). The
28 comparative frameworks established by Bennyhoff and Fredrickson (1994) incorporated a wide
29 range of local and regional traditions but has not been systematically applied outside of the
30 Sacramento Valley. For this reason, the following discussion uses a simple classification based on the
31 three basic periods proposed by Fredrickson: the Paleo-Indian, Archaic, and Emergent (Fredrickson
32 1973, 1974). The Archaic period has been further divided into the Lower, Middle, and Upper Archaic
33 based on newer radiocarbon dates, adjusted with modern calibration curves (Rosenthal et al. 2007:
34 150). The discussion that follows is based on these divisions.

35 **18.1.2.1 Paleo-Indian**

36 The earliest accepted evidence of human occupation in the Central Valley during the Paleo-Indian
37 Period (11,550–8500 BC) comes from the discovery of basally thinned and fluted projectile points at
38 three separate locations in the southern portion of the basin (Rosenthal et al. 2007:151). Recent
39 geoarchaeological studies have shown that periodic episodes of erosion and deposition during the
40 Holocene have removed or buried large segments of the Late Pleistocene landscape (Rosenthal and
41 Meyer 2004; White 2003a). Archaeological deposits associated with these ancient landforms either
42 have been destroyed or lie buried beneath more recent alluvial deposits (Rosenthal et al. 2007:151).

18.1.2.2 Lower Archaic

As with the Paleo-Indian Period, the Lower Archaic Period (8000–5550 BC) is characterized by mostly isolated finds, including stemmed points, chipped stone crescents, and early concave base points. Typical examples of these artifact types have been found on the ancient shore of Tulare Lake (Wallace and Riddell 1991).

18.1.2.3 Middle Archaic

The beginning of the Middle Archaic (5550–550 BC) brought about significant climate changes to the Central Valley: warmer, drier conditions; the development of the Delta as sea levels rose; and the stabilization of fans and floodplains around 5550 BC calibrated (written as cal BC or cal AD; calibration is used to convert the laboratory determination of carbon-dated materials to calendar years) (Rosenthal et al. 2007:152). Around this time, there appeared to be two distinct settlement-subsistence adaptations operating in central California—one centering on the foothills and the other on the valley floor (Fredrickson 1994: 102–103; Rosenthal and McGuire 2004: 161–163). Late Middle Archaic sites appear to be increasingly sedentary, as indicated by refined and specialized tool assemblages and features, a wide range of non-utilitarian artifacts, abundant trade objects, and plant and animal remains indicative of year-round occupation (Moratto 1984; Ragir 1972; Schulz 1970, 1981; White 2003a, 2003b).

18.1.2.4 Upper Archaic

The Upper Archaic (550 BC–AD 1100) is characterized by another change in climate conditions—this time, to a cooler, wetter, and more stable climate. These changes resulted in renewed fan and floodplain deposition and soil formation in the Central Valley (Rosenthal et al. 2007:156). New technologies were developed during this period, including new types of bone tools and bone implements and widespread manufactured goods such as *Haliotis* ornaments and ceremonial blades (Bennyhoff and Fredrickson 1994; Fredrickson 1974; Moratto 1984). The Berkeley Pattern (Fredrickson 1973, 1974) typically contains large quantities of habitation debris and features (such as fire-cracked rock heaps, shallow hearths, house floors, and flexed burials) that reflected long-term residential occupation.

18.1.2.5 Emergent

The archaeological record for the Emergent/Historic Period (AD 1000) is more substantial and comprehensive than those of earlier periods in the Central Valley, and the artifact assemblages are the most diverse (Bennyhoff 1977; Fredrickson 1974; Kowta 1988; Sundahl 1982, 1992). The Emergent Period, which enjoyed a relatively stable climate as opposed to the earlier periods, is associated with the use of the bow and arrow over the dart and atlatl (Bennyhoff 1994). Other characteristics of this period include a regionally variable economy, changes in manufacturing residues at Emergent Period sites, and the decentralization of shell bead production (Rosenthal et al. 2007:159). The Emergent Period matches behavior typically associated with ethnographic populations.

18.1.3 Prehistoric Archaeological Property Types

This section describes the typical prehistoric archaeological property types that are expected in the Plan Area. These property type descriptions are based on the prehistoric archaeological setting

1 presented above. The term *property type* refers to a grouping of properties that share similar
 2 important characteristics. For this setting, property types have been broadly categorized into groups
 3 based on their cultural and historical associations. These two groups are subdivided as discussed
 4 below. It should be noted that these “types” represent idealized and typical types; individual
 5 resources may have characteristics associated with multiple types or may be unique. Sites that
 6 combine the characteristics of multiple types and that contain deposits from different time periods
 7 may be informally called “multi-component” or “multi-occupation” sites.

8 Identified property types provide reasonable expectations of the range of prehistoric archaeological
 9 resources that may be affected by the action alternatives. These property types are classified here in
 10 terms of constituents and features. Seven prehistoric archaeological property types have potential to
 11 be present in the Plan Area: midden/mound sites, multiple-occupation sites, human burials, lithic
 12 scatters, bedrock milling features, baked clay deposits, and isolated artifacts. Each prehistoric
 13 property type is described under a separate heading below.

14 **18.1.3.1 Midden/Mound Sites**

15 Midden is an organically-rich soil generated during human habitation, and is typically darker than
 16 surrounding native soils that were not used as a living surface. Many sites containing midden in the
 17 Plan Area are referred to informally as “mound” sites because the site is elevated about the
 18 surrounding land and appears as a low mound. Mound sites almost always contain midden, but
 19 other site types contain midden as well. Midden and mound sites are anticipated to be the most
 20 structurally complex and to have the greatest artifact diversity of all the prehistoric property types.
 21 Midden deposits can vary greatly in size, and are found where people ate shellfish and other
 22 invertebrates, fish, birds, sea mammals, ungulates, small mammals, acorns, seeds, tubers, and other
 23 food resources. These food sources leave a large amount of debris, which customarily was piled up
 24 where the food was processed, eaten, and discarded.

25 Midden deposits in the Plan Area were generally occupation sites, although some may have been
 26 used only on a seasonal basis. When deaths occurred midden sites were sometimes used as
 27 burial sites. Constituents may include stone flakes (byproducts of stone-tool manufacture), bedrock
 28 mortars, ground-stone tools, marine shell, bone remains, charcoal, baked clay, charred floral
 29 remains, and fire-affected rock. Non-utilitarian artifacts also may include charmstones, shell
 30 ornaments, and beads. Discrete features, including house floors, hearths, and human burials, also
 31 may be located within these deposits.

32 Village sites typically contain midden. It should be noted that while ethnographic sources often
 33 identify villages, villages are not discussed as a discrete site type because village locations typically
 34 manifest archaeologically as midden sites while combined with other archaeological components
 35 such as burials. Midden sites are thus a cross-cutting category that may be associated with different
 36 functional uses. It should be noted that some soils in the Plan Area are rich in organic matter from
 37 natural rather than human sources and thus may appear similar to midden.

38 **18.1.3.2 Multiple-Occupation Sites**

39 These sites are archaeological deposits that contain material associated with two-or more distinct
 40 occupational periods. The cultural remains may be of the same kind (i.e. midden from two distinct
 41 periods), or may be functionally unrelated.

18.1.3.3 Human Burials

Burial features can range in complexity from a simple isolated inhumation (burial or cremation) to more elaborate interments containing numerous bodies. These features may represent specially designated interment areas or remnants of larger archaeological sites. Burial associations often include shell beads and ornaments and ground and polished stone artifacts, such as charmstones and plummets. In the Plan Area, human burials are expected to be found in raised earthen mounds and midden sites, but burials may also be associated with lithic scatters, and have been found in isolation in the archaeological record.

18.1.3.4 Lithic Scatters

Lithic scatters are accumulations of stone artifacts, including finished tools and debitage (all the waste material produced during lithic reduction and the production of chipped stone tools). These sites may or may not contain chronological information, depending on the presence and quantity of temporally diagnostic items such as projectile points and other or dateable materials such as obsidian. Lithic scatters can be simple, containing only flaked-stone debitage and tools, or complex, having primarily flaked-stone debris but some ground stone as well.

18.1.3.5 Bedrock Milling Features

Bedrock milling features are typically bedrock mortars (oval or circular depressions worked into rock) and/or millingslicks (flat grinding surfaces). These features were used for processing vegetal resources such as acorns and other seeds. Because of a dearth of exposed bedrock in the Central Valley, milling features are typically associated with the Sierra Nevada foothills, where exposed bedrock is much more common. These features often have associated artifacts such as pestles and handstones. Flotation analysis (a method of separating light organic material such as fine plant remains from the deposit, in order to identify plant species pursued by prehistoric populations) of adjacent soils often can identify plant types that were processed at these sites. An overview of this resource type is provided by White (2011).

18.1.3.6 Baked Clay Deposits

One baked clay deposit has been identified in the Plan Area. Baked clay artifacts and detritus emerged in the Plan Area in response to the stone tool-impooverished environment of the Delta and surrounding alluvial plains. Accordingly, artifacts of this sort include utilitarian implements, such as grinding tools and net weights for fishing. Bowls and decorative items were made of fired clay as well.

18.1.3.7 Isolated Artifacts

Isolated finds are three or fewer artifacts that occur within a restricted area, generally within an area 30 feet in diameter. Information potential usually is limited to location, material type, style, and function of the individual artifact. Isolated artifacts are not typically able to qualify as historical resources, historic properties, or unique archaeological sites, because they contain very little useful information for prehistoric research.

18.1.4 Ethnographic Setting

During the recent prehistory and historic era at least four main Native American cultural groups inhabited portions of the Plan Area. These groups are the Nisenan, Miwok, Northern Valley Yokuts, and southern Patwin.

18.1.4.1 Nisenan

According to Kroeber (1932), the west side of the Sacramento River is within or near the southern limits of the Nisenan. Several ethnographic Nisenan villages have been documented along the western bank of the river (see Heizer and Hester [1970] and Johnson and Johnson [1974]). Along with Maidu and Konkow, the languages of the Nisenan people's northern neighbors, the Nisenan language forms the Maidu language family of the Penutian linguistic stock (Shibley 1978: 83).

Wilson and Towne (1978) defined three main subgroups within the Nisenan tribe: Northern Hill Nisenan, Southern Hill Nisenan, and Valley Nisenan. The Valley Nisenan resided adjacent to the northernmost extent of the Plan Area before Euroamerican contact.

Valley Nisenan located their permanent settlements along the riverbanks on elevated natural levees near an adequate food and water supply, in fairly open terrain, with southern exposure preferred (Johnson and Johnson 1974; Beals 1933). Villages ranged from "tribelet" of small extended families consisting of 15 to 25 individuals to larger communities with more than 100 people (Kroeber 1925).

Village sizes ranged from 3 houses up to 40 or 50. Houses were domed structures covered with earth and tule or grass. Brush shelters were used in the summer and at temporary camps during food-gathering rounds (Kroeber 1925:407–408). Larger villages often had semi-subterranean dance houses, which were covered in earth and tule or brush and had a central smoke hole at the top. Other common village structures were the sweathouse, used for curing and purification, and the granary, used for storing acorns (Wilson and Towne 1978: 388–389).

The smallest Nisenan social and political unit was the family. Each extended family was represented by a family leader, who was called to council by a headman. The headman of the dominant village in a cluster of villages (tribelet) had the authority to call upon the aid of surrounding villages in social and political situations. The headman also served as village adviser, directed special festivities, arbitrated disputes, and acted as an official host (Wilson and Towne 1978: 393; Beals 1933: 360).

Early Nisenan contact with Europeans appears to have been limited to the southern reaches of their territory, beginning in the early 1800s. Unlike the Valley Nisenan, the groups in the foothills remained relatively unaffected by the European presence until the discovery of gold at Coloma in 1848. In the years following the gold discovery, Nisenan territory was overrun by settlers. Gold seekers and the settlements that sprang up to support them were nearly fatal to the native inhabitants. Survivors worked as wage laborers and domestic help and lived on the edges of foothill towns. Despite severe depredations, descendants of the Nisenan still live in the northern Central Valley and maintain their cultural identity (Wilson and Towne 1978: 396–397).

18.1.4.2 Plains Miwok

The eastern Miwok, and more specifically the Plains Miwok, inhabited the lower reaches of the Mokelumne and Cosumnes Rivers, and the banks of the Sacramento River from Rio Vista to Freeport (Levy 1978: 398).

1 Although the Plains Miwok shared a common language and cultural background, they comprised
 2 several separate, politically independent nations, or tribelets (the primary political unit). The
 3 tribelet represented an independent, sovereign nation that defined and defended a territory. The
 4 tribelet chief, usually a hereditary position, served as the voice of legal and political authority in the
 5 tribelet (Levy 1978: 410).

6 The eastern Miwok village comprised various structures. For houses, conical structures of bark were
 7 used in the mountains, and conical structures of tule matting were used in the lower elevations of
 8 the central Sierra. Semi-subterranean, earth-covered dwellings served as winter homes. Also within
 9 the Miwok settlement were assembly houses, sweathouses, acorn granaries, menstrual huts, and
 10 conical grinding huts over bedrock mortars (Levy 1978: 408–409).

11 With the arrival of trappers, gold miners, and other settlers to California, the Miwok suffered
 12 exposure to introduced diseases. While some hostilities occurred between the Sierra Miwok and
 13 miners, other Miwok groups became involved in agricultural operations on the newly developing
 14 large land grants. The Spanish mission system forcibly assimilated many Plains Miwok circa 1811 to
 15 1836 (Bennyhoff 1977). After California was annexed by the United States, some Miwok were
 16 displaced to Central Valley locations, yet many remained on the rancherias established in the Sierra
 17 Nevada foothills. During the late nineteenth and early twentieth centuries, the Miwok living on the
 18 foothill rancherias adapted to new lifestyles, such as seasonal wage labor on ranches and farms, to
 19 augment subsistence through hunting and gathering (Levy 1978: 400–401). Since the early
 20 twentieth century, many persons of Miwok descent survive and maintain strong communities and
 21 action-oriented organizations (see also Bennyhoff 1977).

22 18.1.4.3 Northern Valley Yokuts

23 The Northern Valley Yokuts were the historical occupants of the central and northern San Joaquin
 24 Valley. *Yokuts* is a term applied to a large and diverse number of people inhabiting the San Joaquin
 25 Valley and Sierra Nevada foothills of central California. The Northern Valley Yokuts' territory
 26 extended from near where the San Joaquin River makes a big bend northward to a line midway
 27 between the Calaveras and Mokelumne Rivers (Wallace 1978: 462).

28 For the Northern Valley Yokuts, the San Joaquin River and its main tributaries served as a lifeline to
 29 the valley, and their villages congregated around these main water sources. They gained much of
 30 their livelihood through fishing (in particular, salmon fishing) and varied their diet with waterfowl
 31 and the harvesting of wild plant food, such as acorns, tule root, and seeds (Wallace 1978: 464).

32 Most settlements, or at least the principal ones, were built atop low mounds, on or near the banks of
 33 large watercourses, for protection against spring flooding (Schenck 1926:132; Schenck and Dawson
 34 1929: 308; Cook 1960: 242, 259, 285). Settlements were stable and occupied over multiple
 35 generations. However, flooding posed the primary threat to a fully stationary existence, and the local
 36 rivers, swollen from melting Sierra Nevada snows and heavy rains, periodically overflowed their
 37 banks and drove the villagers to even higher ground (Wallace 1978: 466).

38 A headman guided each tribe, and village populations averaged around 300 people. Family houses
 39 were round or oval, with a cone-shaped pole frame sunk into the ground and covered with tule mats.
 40 Each village also had a community lodge for dances and community functions, as well as a
 41 sweathouse (Wallace 1978: 465).

1 The Northern Valley Yokuts suffered great population decline and cultural breakdown when they
 2 were drawn into the mission system. Following the mission period, Northern Valley Yokuts
 3 continued to clash with the white settlers, and as a result, many villages were burned. The
 4 population decline continued through the early American period, as the rich soils of the Delta and
 5 valley attracted former miners and other settlers to farming. As they filled up the district, the
 6 remaining Yokuts were driven off their hunting and food-gathering lands (Wallace 1978: 468–469).
 7 As with the Miwok and the Nisenan, however, tribal population has surged in the latter decades of
 8 the twentieth century, along with a renewed interest in traditional Yokuts culture. Today, the
 9 descendants of the Yokuts live primarily on the Tule River Indian Reservation near Porterville,
 10 established in 1873, and the Santa Rosa Rancheria near Lemoore, established in 1921 (World
 11 Culture Encyclopedia 2008).

12 **18.1.4.4 Southern Patwin**

13 The southern Patwin were a series of linguistically and culturally related tribelets that occupied a
 14 portion of the lower Sacramento Valley west of the Sacramento River and north of Suisun Bay. They
 15 resided adjacent to the Plan Area and probably used lands within its boundaries. These groups had
 16 no common name, but spoke dialects of a single historically related language that extended
 17 southward to the Delta. Patwin tribelets maintained their own autonomy and sense of territoriality
 18 and typically consisted of one primary and several satellite villages. Villages were located along
 19 waterways, often near the junction with another major topographic feature, such as foothills or
 20 another waterway. The ethnographically documented villages nearest to the Plan Area were *Aguasto*
 21 and *Tolenas*, both situated immediately north of San Pablo Bay to the west-northwest (Kroeber
 22 1925, 1932).

23 The largest political unit for the Patwin was the tribelet, which consisted of one primary and several
 24 satellite villages. Each tribelet had a discrete territory as well as autonomy relative to other social
 25 units. While a common language unified these social units, tribelets each had subtle cultural
 26 differences relative to one another. Within the tribelet were several political and social distinctions,
 27 including a chief who oversaw village activities; this position was passed through inheritance from
 28 father to son (Johnson 1978:354).

29 Patwin villages contained four main types of permanent structures: the dwelling or family house;
 30 the ceremonial dance house, which was usually built at a short distance to the north or south end of
 31 a village; the sudatory (sweathouse), which was positioned at either the east or the west of the
 32 dance house; and the menstrual hut, which was placed on the edge of the village, farthest from the
 33 dance house. All of these were earth-covered, semi-subterranean structures with either an elliptical
 34 or circular shape (Johnson 1978: 357–358).

35 The principal subsistence activities of the Patwin were hunting, fishing, and the gathering of wild
 36 plants. Along with the acorn, the primary staple, the Patwin gathered buckeye, pine nuts, berries,
 37 wild grapes, and other plants. Each village had its own location for these food sources, and the
 38 village chief oversaw the procurement of food for the village (Johnson 1978: 355).

39 Population estimates for Patwin groups, from pre-contact until 1833, are more than 15,000
 40 (Kroeber 1932; Cook 1955). The Patwin were in contact with the Spanish missions by the late
 41 eighteenth century, and some of the earliest historic records of the Patwin are found among mission
 42 registers of baptisms, marriage, and deaths of Native American neophytes. Mission San Jose,
 43 established in 1797, along with Mission Dolores, actively proselytized Patwin from their southern

1 villages, and Mission Sonoma, built in 1823, also baptized neophytes, until the secularization of all
 2 missions by the Mexican government in 1832–1836. Afterward, many tribal territories were divided
 3 into individual land grants (Johnson 1978: 351).

4 The U.S. conquest of California (1846–1848) was followed by a massive influx of American settlers
 5 into Patwin territory. To facilitate the development of ranching, agriculture, mining, and large
 6 settlements, the Patwin were usually moved to reservations. However, some Patwin assimilated
 7 themselves, at least partially, into white culture by working as ranch laborers (Johnson 1978: 351).
 8 Today, some Patwin descendants live on the Colusa, Cortina, and Rumsey Rancherias; although
 9 many of the people living on these rancherias are of general Wintun descent.

10 **18.1.5 Traditional Cultural Properties and Native American** 11 **Property Types (Including Sacred Sites)**

12 A traditional cultural property (TCP) is defined generally as a property that is associated with
 13 cultural practices or beliefs of a living community that (a) are rooted in that community's history for
 14 at least 50 years and (b) are important in maintaining the continuing cultural identity of the
 15 community (National Park Service 1998:1). Examples of TCPs range from expansive geographic
 16 areas such as the Sutter Buttes and Mt. Diablo to individual locations associated with beliefs or
 17 practices that are of traditional cultural significance. Examples of TCP types are described under
 18 separate headings below. Individual TCPs can qualify for listing in the NRHP if they meet the criteria
 19 described in *National Register Bulletin 38* (National Park Service 1998). In order to qualify, the TCP
 20 must retain the characteristics associated with its traditional use (integrity of condition) and still
 21 perform the traditional cultural function for which it is significant (integrity of relationship)
 22 (National Park Service 1998: 11–12), and must meet the criteria for listing in the NRHP (National
 23 Park Service 1998:12). TCPs may be associated with indigenous cultures or other communities.

24 Some Native American property types within the study area are typically associated with resource
 25 procurement activities along the waterways of the Central Valley, Delta, and adjacent foothills. Such
 26 Native American properties derive their significance not from the property itself, but from the role
 27 the property plays in the cultural practices or beliefs of an extant community or identifiable social
 28 group. Such properties have not been identified within the study area; however, there is a possibility
 29 that plant-gathering, fishing, and ceremonial and sacred sites that may occur in the study area
 30 qualify as TCPs. Native American property types that are not TPCs within the narrow criteria of
 31 *National Register Bulletin 38* may still be important cultural resources.

32 Sacred sites, as defined under Executive Order 13007 are also protected under federal law. This
 33 order recognized sacred sites as religious and ceremonial sites. When such sites are identified by
 34 authoritative Native American representatives, federal land managers must accommodate access to
 35 such sites and avoid adversely affecting their physical integrity.

36 **18.1.5.1 Plant-Gathering Areas**

37 Many Native American groups gather the same plant resources that have been used by their
 38 ancestors for centuries. Some gathered resources are used for subsistence or medicine, but Native
 39 Americans who currently practice traditional plant gathering focus more on materials for producing
 40 baskets and other items. Typical resources gathered for food include acorns, buckeye nuts, wild
 41 onion, and wild sweet potato. Resources gathered for materials include tule, willow, and various
 42 native grasses.

18.1.5.2 Fishing Locations

Fishing played an important role in the lives of Native Americans within the Plan Area. Some Native American groups still procure fish (particularly salmon) using traditional methods, including weirs, nets, harpoons, and traps. There may be areas where Native American groups still practice these traditional procurement methods within the Plan Area.

18.1.5.3 Ceremonial and Sacred Sites

Some areas regarded as sacred by Native American groups are still used for ceremonial purposes. These areas are typically associated with an event or a viewshed of particular importance. Often, these are ancient village sites or meeting sites where tribal leaders from the region would gather, or sites with views of areas important to their religious beliefs. Reclamation is required under EO 13007 to accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners and to avoid adversely affecting the physical integrity of such sacred sites. There are no known federal lands with Indian sacred sites nor access to any sacred sites in the proposed Plan Area. Should any sacred sites be identified through later consultations the federal lead agencies will follow EO 13007 in accordance with the Section 106 programmatic agreement.

18.1.5.4 Historic-Era Traditional Cultural Properties

Historic-era built-environment resources may qualify as TCPs as well; examples of historic-era TCPs include some community gathering halls and neighborhoods associated with discrete and identifiable living communities. Like all TCPs, historic-era TCPs must meet the NRHP-eligibility criteria.

18.1.6 Historic-Era Setting

The following section summarizes the historic context developed in the technical report supporting the findings of the built-environment field survey. The resources and events described in the setting are intended to provide an overview of the significance themes associated with the geographic area surrounding the location where impacts may occur. Impacts are identified after the setting in Section 18.3, *Environmental Consequences*. A more detailed discussion of the Delta's history can be found in the technical report prepared to document the inventory and evaluation of accessible built-environment resources (ICF 2012). The Delta's historic-era built environment is largely the product of agricultural and residential development, as well as fishing, canning and other industrialized produce processing. These were facilitated by land reclamation and by transportation development, the latter of which initially depended on Delta waterways but eventually served to surmount those waterways. The Delta's built environment has also been shaped by large-scale flood control and water management efforts, as well as recreational activities such as fishing and boating.

18.1.6.1 The Spanish Era to the Gold Rush

The first Spanish expedition to reach the Delta was led by Captain Pedro Fages in 1772, and it did not spark interest in colonizing the region. Instead, the Spanish presence in California remained concentrated mainly along the coastal strip of missions and *presidios*, the nearest of which was located west of the Delta. During the early nineteenth century Spanish and Mexican soldiers sometimes entered the Delta region on incursions to capture Native Americans who had fled missions. When Mexico achieved independence from Spain in 1822, California became a territory of

1 Mexico, but remained a remote frontier province. By the end of the decade, American fur trappers
 2 began to enter the San Joaquin Valley and the Delta after hearing reports of abundant beaver that
 3 circulated after Jedediah Smith’s trapping expeditions through central California in 1827 and 1828.
 4 Fur trapping in and around the Delta resulted in a steep decline of beaver populations, and fur
 5 trappers introduced diseases in the region that also heavily affected Native American tribes (Owens
 6 1991:15; Sandos 2004: 1–13, 99–103; Thompson 1957: 88–90, 94–109).

7 By 1848, when gold was discovered at Sutter’s Mill in Coloma, only a handful of people had settled in
 8 the Delta, but thousands of newcomers traveled Delta waterways en route to the foothill and
 9 mountain mines to the east. Sacramento and Stockton developed as shipping centers and stopovers
 10 for the mining economy. Some California newcomers made the sometimes lucrative decision to
 11 forego mining and produce food to feed the growing population of miners. Farmers began to work
 12 land at the edge of the Delta, along the natural levees of the major rivers draining into it. Known as
 13 “rim landers,” these early settlers built so-called *shoestring levees* atop the natural levees to
 14 withstand the highest tidal rises. Later, more extensive levee construction would transform the
 15 Delta (Paul 1973: 19–20; Street 2004: 117; Thompson 1957: 133–146).

16 **18.1.6.2 Land Reclamation**

17 The Swampland Act of 1850 and subsequent creation of the State Board of Swamp Land
 18 Commissioners enabled groups of small landholders to establish districts to undertake Delta land
 19 reclamation. Lack of cooperation among small landholders and new legislation allowed most Delta
 20 agriculture to be dominated by wealthy absentee owners rather than modest independent farmers.
 21 Two large firms formed in the 1860s, George Roberts’s Tide Land Reclamation Company and Morton
 22 Fischer’s Glasgow-California Land and Reclamation Company, dominated Delta reclamation into the
 23 late nineteenth century. Speculative, large-scale land reclamation brought thousands of Chinese
 24 workers to the Delta. Their labor first enabled the construction of levees and then helped the islands
 25 created by such reclamation efforts yield abundant produce (Garone 2011: 113; Kelley 1989: 60;
 26 Lund et al. 2007: 20; Owens 1991: 19; Thompson 1957: 198–202, 225).

27 Reclaimed lands required constant and expensive maintenance and repair. Levees frequently failed
 28 and islands flooded. Sacramento and San Joaquin River beds were raised and choked by tailings
 29 from hydraulic mining in the Sierra Nevada Mountains, which was outlawed in the mid-1880s but
 30 had a longer lasting impact on rivers. The floors of the Delta’s peat land islands frequently
 31 underwent subsidence, causing groundwater seepage to create new marsh areas. Upstream
 32 irrigation draws caused saltwater intrusion deeper into the Delta.

33 Technology helped landowners overcome some of these problems. The introduction of clamshell
 34 dredges in 1879 enabled the construction of increasingly larger and more secure levees. Modern
 35 pumps and the introduction of electricity allowed for more efficient and thorough draining of
 36 flooded islands. By the early twentieth century, the rise of industrial agriculture across the Delta
 37 increased pressure for state and federal action to protect and facilitate the region’s agricultural
 38 economy through flood control efforts, transportation development, and large-scale water policy
 39 and development in the early twentieth century (Garone 2011:115: 155; Thompson 1957: 226–272;
 40 Thompson 2006: 48, 55, 65).

18.1.6.3 Agriculture

Agricultural activity initially took place on higher lands near natural levees and rises along the Sacramento River, where farmers raised potatoes, onions, and beans, among other crops, and grazed cattle and sheep. By 1852 the banks of the lower San Joaquin River were almost entirely occupied by small-scale farming operations as well. From the 1860s through the 1880s, reclamation spread agriculture from alluvium lands upstream into the peat lands of the central Delta. Growers typically planted newly reclaimed islands in grains, especially wheat. With water access to a growing urban market in San Francisco, Delta agriculture boomed and crops were diversified. By 1883, large tonnages of vegetables were being shipped to San Francisco in steamers that allowed Delta vegetables and fruit to be sold a day after they were harvested. Over time, dairies, Bartlett pear orchards, and asparagus became important components of the Delta economy (Lokke and Simmons 1980: 223-224; Rawls and Bean 2003: 201-02; Thompson 1957:139-44; Thompson 2006: 52, 56, 61-63).

On land created by large-scale speculative reclamation, patterns of Delta agriculture production usually bore little resemblance to the image of an American farm worked and owned by an independent Anglo-American farmer. Large land holdings were divided into agricultural “camps” with a resident superintendent. American-born Delta farmers tended to be engaged in grain, orchard, and livestock husbandry as lessees, farm managers, and in a few cases, independent farmers. They sometimes subleased to ethnic entrepreneurs who then arranged to have members of their ethnic communities work the land. Chinese, Italian, and Portuguese tenant farmers often specialized in garden or truck farming. Chinese agricultural laborers also became associated with row crops, especially nineteenth-century potato cultivation. In the twentieth century, Japanese farmers frequently engaged in potato and asparagus production. Japanese entrepreneurs George Shima and Hotta Kamajirō built agricultural empires, but most Japanese farmers were hampered with discriminatory laws that barred them from land ownership and eventually barred them from leasing land as well. Beginning in the 1920s, Filipino and Mexican day laborers also worked Delta lands (Azuma 1994: 14-20; Miller 1995: 180-182; Thompson 1957: 300-302, 305-306, 309-310, 312-314, 331, 335).

Technological advances in the first decades of the twentieth century signaled the arrival of modern industrial farming after World War I. “Caterpillar” tractors became commonplace in the Delta, particularly among the large land companies. Although large acreage continued to be reclaimed, a good deal of island land was improved through the introduction of electric pumps. The sale of field crops by consignment to wholesale markets or shippers nurtured the rise of canneries and wholesale produce houses with product standards and field buyers. Adding to the Delta’s industrial built environment of salmon canneries developed in the latter nineteenth century were new industrial complexes resembling urban factories, which often employed ethnic laborers to help make sugar out of sugar beets or can fruit, asparagus, and other vegetables (Armentrout-Ma 1981: 149; Thompson 1957: 281, 296-298, 312, 314-318, 343-344).

18.1.6.4 Transportation Development

During the Gold Rush, most Americans who encountered the Delta did so as passengers of sailboats and steamers en route between San Francisco and the mines east of the Delta. A few trails and later roadways complemented the water traffic. Only after the start of the twentieth century did roads begin to dominate traffic in the Delta with the introduction of the automobile and truck. Ferries connected roads with agriculture on remote islands. Anxious to retire their ferries, island owners

1 convinced county governments to take over their operation and maintenance. Ferries were always a
 2 short-term solution to a transportation problem, and most land owners awaited local, state, or
 3 federal investment in bridge construction to connect them more directly to markets. Nevertheless,
 4 ferry boats still operate at the Empire Tract, Woodward Island, and connecting Jersey Island with
 5 Bethel Island, among others. Early trails evolved into roads traveled by stages hauling freight back
 6 and forth between the farms and the small towns that took shape behind recently constructed
 7 levees. Railroads also played an important role in the development of agriculture, especially after
 8 the beginning of the twentieth century. The San Joaquin Railroad was completed across the Delta in
 9 1897 and purchased by Atchison, Topeka, & Santa Fe in 1898. Originating primarily in Antioch,
 10 Stockton, and Sacramento, steamboats plied the waterways on set schedules dropping off workers
 11 and supplies and transporting harvested crops (Daggett 1922: 122, 334; Thompson 1980: 145–147).

12 After 1900, county and state investment nurtured bridge construction, which in turn enabled the
 13 development of year-round roads serving Delta residents and visitors. During the first decade of the
 14 twentieth century, the construction of steel draw and swing bridges across Georgiana Slough, both
 15 the North and South Forks of the Mokelumne River, and the Sacramento River below the head of
 16 Grand Island, provided for road connections from Walnut Grove and Brannan, Andrus, and Grand
 17 Islands to the population centers of Sacramento and Stockton. During the 1910s and early 1920s,
 18 additional bridge construction and road development connected the era's increasing automobile
 19 traffic from the earlier established roads to new routes extending to Isleton and Rio Vista. In 1915
 20 the American Bridge Company completed the Middle River Bridge, currently the second oldest steel
 21 swing bridge in California. This bridge facilitated development of the southern Delta's Borden
 22 Highway, or State Route 4 between Stockton and Contra Costa County. By 1922, the completion of
 23 River Road through the northern Delta allowed motorists to travel from Stockton and Sacramento
 24 across the northern Delta to Vallejo. Constructed in 1926 to replace a major ferry crossing, the
 25 American Toll Bridge Company's Antioch Bridge provided for completion of the Victory Highway
 26 route, which crossed the Delta to connect Sacramento and the East Bay via Antioch. No longer extant
 27 electric interurban railroads also extended into portions of the Delta during the early twentieth
 28 century (Blow 1920: 226; California Department of Transportation 1990: 116–117; Thompson
 29 1980: 151–154, 163).

30 **18.1.6.5 Community Development**

31 During the mid-nineteenth century, Sacramento and Stockton took shape east of the Delta and
 32 became the most important supply ports and trading centers of the central California interior,
 33 dwarfing the small and modest-sized agricultural shipping hubs and processing centers that
 34 developed into Delta communities. Some of these Delta towns—Courtland, Rio Vista, Isleton,
 35 Knightsen, and Byron—are located outside but in the vicinity of the study area. These communities
 36 are discussed below because historically, residents of nearby properties within the study area likely
 37 identified themselves as members of those communities even while living on their peripheries.
 38 Hood, Locke, Holt and portions of Clarksburg and Walnut Grove are located within the study area.

39 Clarksburg was established in 1850 in the northernmost Delta as a commercial fishing community
 40 along the Sacramento River. The river banks north of Clarksburg attracted Portuguese settlement in
 41 what came to be known as the Lisbon District. The American Crystal Sugar Company developed a
 42 sugar refinery north of Clarksburg in the 1920s that continued to operate into the mid twentieth
 43 century. The community of Courtland was established on Randall Island approximately six-and-a-
 44 half miles south of Clarksburg along the east bank of the Sacramento River in 1867, when a post
 45 office was moved there from Onisbo across Steamboat Slough. Fruit production and other

1 agricultural activity on Randall, Grand, and Sutter islands initially drove the town's economy.
2 Encompassing wharves, a hotel, and stores, Courtland experienced continued growth after 1900 as
3 asparagus became the dominant crop. Unlike other Delta landing settlements, Courtland sent its
4 fruits and vegetables to Hood for canning and other processing. Initially known as Richland, Hood
5 was established in 1860 as a river landing with a warehouse and school house serving nearby
6 agricultural producers. Located nearly seven miles southeast of Courtland, Walnut Grove was
7 founded in 1851 by John W. Sharp. By the end of the 1870s the town had a post office, hotel,
8 schoolhouse, meeting hall, sheltered wharf, and warehouses. The construction of nearby bridges and
9 ferry services linked Walnut Grove to other towns as asparagus production boosted the local
10 economy in the twentieth century (Gregory 1913: 158; HARD Townsite Team 2007: 79–80; Reed
11 1923: 121; Thompson 1957: 427–28, 431).

12 Located approximately 11 miles southwest of Walnut Grove, Rio Vista was founded by members of
13 the Brazos del Rio ("Arms of the River") community that flooded in 1861. Displaced Brazos del Rio
14 residents established the new town on the ranch lands of Joseph Bruning adjacent to the Montezuma
15 Hills. Rio Vista became a major wheat producer as well as an important shipping center. Between,
16 1868 and 1878 the population within a ten mile radius of Rio Vista grew from 200 to 1,500. At the
17 turn of the century, Rio Vista's wharf was the Delta's busiest. Cannery operations began in Rio Vista
18 in 1904. The river on the east side of the town was spanned in 1918 by a bridge to Brannan Island.
19 Four miles east of Rio Vista, Isleton was founded in 1874 by Dr. Josiah Pool as an agricultural service
20 town and shipment landing. By 1878, the bustling town had a city hall, a water company, a
21 warehouse, a hotel, a grange hall, two saloons, a blacksmith's shop, several stores, and a commercial
22 ferry that ran to Grand Island and Rio Vista. During the twentieth century, Isleton became a center of
23 asparagus and other vegetable canning, including the Libby, McNeal & Libby operations (HARD
24 Townsite Team 2007: 79; Thompson 1957: 429–30; Thompson 2006: 63–65).

25 Most of these northern and central Delta communities included Asian immigrant enclaves.
26 Chinatowns comprised of two-story wood-frame buildings took shape in Walnut Grove, Isleton,
27 Courtland, and Rio Vista during the late nineteenth century. Delta Chinatowns housed workers and
28 high status bosses and merchants, and included vice-oriented venues such as opium dens, brothels,
29 and gambling halls. After fire burned Walnut Grove's Chinatown in 1915, members of the
30 community's ethnic Chungshan population—who were prohibited from owning land under the
31 California Alien Land Act of 1913—leased nine acres north of Walnut Grove from George Locke and
32 established a new Chinatown that became known as Locke. Locke residents created an unusual mix
33 of traditional Chinese building patterns and Delta vernacular architecture in the two-story buildings
34 overhanging Locke's 12-foot-wide main street. In the early twentieth century, Japanese immigrants
35 and their Nisei offspring settled in and farmed the Delta in increasing numbers. Limited by the alien
36 land laws barring Japanese land ownership, Japanese farmers nevertheless established new ethnic
37 enclaves in Delta towns such as Walnut Grove and Isleton (Charleton 1990: 23–25; Hoover et al.
38 1990: 314–315).

39 Towns established within and in the vicinity of the conveyance alignments include Holt, Byron, and
40 Knightsen. Located approximately seven miles west of the Stockton embarcadero is Holt, a small
41 enclave established as a freight-car loading point along the Atchison, Topeka, and Santa Fe Railroad
42 (Santa Fe) line completed in 1897. Holt was named for brothers Benjamin and Frank Holt, who
43 founded Stockton's Holt Manufacturing Company. Byron was established along the Southern Pacific
44 Railroad line in 1878 approximately 12 miles southwest of Holt. Wheat farming initially drove
45 Byron's economy. Water from the Byron-Bethany irrigation district (1915–1916) helped diversify
46 the town's agricultural output with almond, walnut, alfalfa and dairy production. Knightsen was

1 founded along the Santa Fe Railroad line at seven miles north of Byron in 1899. The town's
2 agricultural activity featured celery, dairy, and silkworm production. By World War I Knightsen
3 consisted of residences, a store, blacksmith shop, garage, and a saloon (Hoover et al. 2002: 68, 370–
4 371; Hulanski 1917: 404–05, 426–428; Thompson 1957: 411, 416, 425; Tinkham 1923: 339–340).

5 **18.1.6.6 Water Management**

6 The Delta became a focal point of increasingly large-scale water engineering and management
7 during the early twentieth century. Pressure to ameliorate ongoing flood threats due to the legacies
8 of hydraulic mining led to 1917 legislation creating the first federal control project. The plan
9 included nearly two hundred miles of levees, several hundred miles of bypass channels, and
10 ultimately the rerouting of floodwaters of the Sacramento, Yuba, and American Rivers. Large
11 dredges in use in the Delta for decades were now employed to build new levees and create channels
12 for flood control.

13 Numerous canals and straightened and widened river channels were by-products of the islands and
14 levees created by Delta reclamation. These functioned as an important water source for irrigation
15 and provided both recreational boating waterway and dredge access for levee construction and
16 maintenance. The simplest and most cost-efficient method by which to obtain levee material was to
17 dig a large ditch and build a berm on one side (the levee), with the ditch filling in with Delta waters
18 on the other side (the canal). Late nineteenth century dredges were capable of moving up to 400
19 cubic yards of earth per hour. The use of similar dredges across the Delta explains the similar
20 appearance of many of the canals throughout the Delta. Most Delta canals appear to have been
21 opportunistically created rather than being formally engineered, hence no design or “as-built”
22 drawings for early canals and levees have been located. Nevertheless, with federal involvement in
23 flood control after 1917, and especially in the 1920s, plans were drawn and implemented for
24 standard levees and canals for both the Sacramento and Mississippi deltas (Kelley 1989: 252, 288–
25 291; Mowry 1951: 152; Pisani 1984: 255).

26 California's great Central Valley and many smaller valleys to the west and south had abundant land
27 but lacked the water resources necessary for expanded agriculture. The federal Newlands
28 Reclamation Act of 1902, improvements in irrigation technology, and improving transportation
29 technology and networks all held out promise for agricultural expansion in California. Limits on
30 water availability remained the major hindrance to such expansion. After World War I, groundwater
31 levels dropped under drought conditions, and saltwater reached east into the Delta as far as
32 Courtland. At the end of the 1920s, state engineer Edward Hyatt developed a State Water Plan to
33 respond to growing water problems. In 1928 the state's voters approved a constitutional
34 amendment that limited the holders of riparian water rights to reasonable use of their water, which
35 opened the way for the state legislature to pass the Central Valley Project Act in 1933. The
36 Department of Interior's Bureau of Reclamation ultimately took responsibility for the Central Valley
37 Project (CVP) at the behest of Congress. The project included pumping plants that would divert
38 Sacramento River water southward through a series of canals linking with the Delta-Mendota Canal,
39 which was designed to replace water diverted from the San Joaquin River at Friant Dam in the
40 southern Sierra Nevada. Most of the Central Valley Project was completed by the early 1950s,
41 including more than 500 miles of canals and 20 dams and reservoirs. After World War II, the state's
42 Water Resources Control Board began planning for additional large-scale water management
43 projects. Then state engineer Arthur D. Edmonston developed a state water plan entailing major
44 new water impoundment and conveyance development. Known as the State Water Project (SWP),
45 Edmonston's plan promised to augment flows to the Delta during dry years and develop state-

1 funded canals to convey additional water to the San Joaquin Valley and new supplies to Santa Clara
 2 and Alameda Counties. The plan also called for the development of pumps to transmit Delta water to
 3 what would become known as San Luis Reservoir and to a huge aqueduct conveying water south to
 4 be pumped over the Tehachapi Mountains into Southern California. In 1960 voters approved the
 5 financing for the project, and the first phase was implemented between 1962 and 1971 (Cooper
 6 1968: 50–52; Kahrl 1979: 46–51; Rarick 2005: 205–228).

7 **18.1.6.7 Recreation**

8 Wild game and abundant fisheries have attracted people to the Delta for millennia, but with the
 9 arrival of Jedediah Strong Smith and other Americans in the first half of the nineteenth century,
 10 market hunting and commercial fishing began to dominate the marshes. By the end of the century,
 11 however, several factors contributed to a change in emphasis from market to non-sale game and
 12 from commercial fishing to sport and recreation. In addition, investors reclaimed swamp land faster
 13 than the same could be put to productive agricultural uses, opening large areas for alternative uses,
 14 including recreation. By the first decades of the twentieth century the Delta became a haven for
 15 sportsmen and by the 1920s, with the construction of year-round roads and bridges, hotels and
 16 campsites, it had become a destination for the recreational driver, the car camper, and the sightseer.
 17 In the post-World War II era, the widespread development of tract housing bypassed the Delta,
 18 primarily due to land ownership patterns, limited transportation options, and the overabundance of
 19 water. At the same time, those factors helped to foster an increased demand for recreational
 20 opportunities and the proliferation of house and party boats. Recently, wetlands restoration has
 21 made the Delta a destination for bird watchers as several communities have embraced rare and
 22 endangered birds (California Department of Water Resources 1995: 37–48; Schell 1979: 196;
 23 Gardner 1964: 8–19; Steienstra 2012: 289; Thompson 1957: 58; Young 1969: 1).

24 **18.1.7 Historic-Era Built Environment Property Types**

25 This section outlines property types and subtypes known to be located in the geographic area where
 26 conveyance facilities may be constructed and where conservation measures may be implemented
 27 (the study area). The property types are organized chronologically, according to the historical
 28 themes that generated these resources. Surveyors recorded built-environment resources that were
 29 45 years old or older. These structures range from mid-to-late-nineteenth-century wood-frame
 30 Delta residences to properties constructed in roughly the middle of the twentieth century. Specific
 31 property types include buildings, structures, districts, landscapes, transportation facilities, and
 32 reclamation and flood management buildings and structures. Relatively few nineteenth-century
 33 buildings have been identified in the study area, reflecting both the sparse settlement during that
 34 century and the vast changes that have occurred in more recent decades. These scarce nineteenth-
 35 century buildings are more valuable for their rarity. However, the development of communities in
 36 the Delta during the twentieth century is represented by a variety of building property types.
 37 Residential and agricultural buildings make up the bulk of these properties in the study area, but
 38 there are also a moderate number of commercial and industrial buildings within the study area that
 39 illustrate equally important components of this development.

40 **18.1.7.1 Residential Buildings**

41 Residential buildings constructed in the nineteenth century are scattered throughout the region.
 42 These residences exhibit Anglo-American and vernacular styles. Many of the buildings in the Delta

1 reflect adaptation to local conditions such as flooding, as well as the adherence to design and
2 structural forms consistent with the larger architectural style. One example of conformity within
3 architectural design can be seen in what are commonly referred to as “river homes,” or “Delta
4 homes.” These two-story buildings were often built within feet of levees and below the river level.
5 Some of the examples are located in the study area along River Road, the meandering State Highway
6 160 atop the Sacramento River levee. The second stories of these homes frequently extended
7 beyond the height of the levee, and in the event of a flood, it is customary for the occupant to open
8 all doors and windows on the ground floor, and retreat to the dry, second floor.

9 Many of the relevant styles fall into the picturesque movement, including the romantic, Gothic
10 revival, Greek revival, Italianate, and Victorian styles. These nineteenth-century homes are found on
11 farms, smaller ranchettes, and in small towns throughout the study area. They also span a wide
12 socioeconomic range, from modest vernacular cottages in the smaller towns to grand Beaux Arts
13 mansions on the pioneering farms and ranches. The urban homes are generally built in the same
14 styles as the rural homes and are typically cottages on small residential parcels that may also
15 include a garage, fences or walls, and landscaping. Homes on farms and ranches may be contributors
16 to rural historic landscapes, the evaluation of which involves consideration of the property as a
17 whole, including residences as well as other ancillary buildings, structures, circulation systems, and
18 boundary demarcations.

19 Residential buildings in the Delta constructed during the twentieth century include Craftsman-style
20 bungalows, and Foursquare, Colonial Revival, Spanish Colonial Revival, Minimal Traditional, Ranch-
21 style residences. These buildings were mainly constructed during the first half of the twentieth
22 century in urban, rural, and suburban settings. The grand period revival farm and ranch mansions
23 from the 1910s and 1920s represent some of the more striking property types. Rural homes also
24 typically exist within a cluster of farmstead buildings, from barns to packing sheds to equipment
25 sheds, and tank houses. House boats and floating cabins exist along several of the major sloughs
26 within the study area. It is not uncommon to see dilapidated homes (at times reclaimed by the
27 Delta’s waterways), sheds, and general agricultural infrastructure in a variety of massing and scale.

28 Residential buildings exist in the small towns, such as Clarksburg, Hood, Locke, and Walnut Grove.
29 With rare exceptions, the residential structures in these small towns lack the fine design of the
30 grand rural properties. Suburban development dates almost exclusively to the post–World War II
31 era. Homes in small suburban riverfront enclaves best reflect the ranch style and other mid-century
32 modern styles.

33 **18.1.7.2 Commercial Buildings**

34 Commercial buildings located within the study area include a range of compositional types
35 representing a variety of economic activities. Commercial buildings include stores, banks,
36 agricultural vendors, and office buildings, and are typically one-part commercial block buildings
37 with moderately decorative facades. Commercial buildings, with rare exceptions, exist in the small
38 towns as well as the larger communities. Twentieth-century commercial buildings in the rural Delta
39 occur almost exclusively in the small towns, including Clarksburg, Hood, Locke, and Walnut Grove.
40 Although generally small in scale (reflecting the modest scale of commercial activity), these
41 buildings mimic the design of commercial buildings in bigger cities. The few nonurban commercial
42 buildings in the region comprise roadside or waterfront service buildings, such as stores and
43 restaurants.

18.1.7.3 Agricultural Properties

Several property types within the study area are associated with the historical theme of agriculture. The infrastructure of agricultural properties includes individual ranchettes, large orchards and pastures, labor camps, and processing facilities, each of which include a consistent assemblage of mostly utilitarian buildings and structures that provide explicit functions.

Agricultural buildings and structures within the study area include residences, barns, tank houses, shed outbuildings, grain silos and elevators, culling chutes, corrals, fences, and irrigation or drainage ditches. The majority of these resource types date primarily to the early twentieth century and reflect a broad range of architectural styles, from period revival mansions to vernacular barns, tank houses, and weathered storage sheds. Of these architectural types, the most prominent agricultural structure found within the study area is the gable-roofed barn. These barns share similar characteristics, including moderately steep gables, tall sidewalls, rectangular massing, and post and beam construction.

18.1.7.4 Historic Districts

In addition to individual buildings, cultural resources can include historic districts. The National Park Service defines *historic district* in *National Register Bulletin 15* as possessing “a significant concentration, linkage, or continuity of sites, buildings, structures, or objects united historically or aesthetically by plan or physical development” (National Park Service 1987a:5). Examples of NRHP listed historic districts include Locke and portions of Walnut Grove. Locke was listed in 1971, while the constituent elements of Walnut Grove were listed between 1980 and 1990. These districts each contain a cluster of buildings that are connected by similar themes of Asian-American settlement and agriculture in the Delta. While these historic districts include a few nineteenth-century residences and commercial buildings, they are dominated by buildings constructed during the first few decades of the twentieth century. These districts reflect a wide range of functional building types, including residential buildings, agricultural buildings and structures, and commercial buildings. Districts also include scattered industrial buildings generally associated with food storage or processing.

Districts are not limited to urban settings. South River Road, in the vicinity of Clarksburg, has a series of late-nineteenth and early-twentieth-century grand rural homes associated with agriculture that collectively could be considered a district. Also identified on South River Road are a series of “river” or “Delta” homes built between 1855 and 1875. These modest vernacular buildings are associated with early Portuguese settlers and comprise what is known in the region as the Lisbon District.

18.1.7.5 Reclamation and Flood Management Structures

The single greatest factor advancing settlement in the Delta was the reclamation of land and the introduction of flood-management systems that shaped the landscape to accommodate the agricultural development that still characterizes the region. The entire Delta’s natural landscape was significantly altered and many features of these introduced systems are extant. Compared to many built resources in the region, reclamation and flood-management structures have had minimal consideration as historical resources.

Typical structures associated with reclamation and flood management include levees, canals, and land-side irrigation and water conveyance infrastructure such as ditches, pump houses, and other

1 structures that support reclamation and agriculture on reclaimed uplands. These structures range in
 2 sophistication from shoestring levees built in the nineteenth century, which required frequent
 3 repair and reconstruction, to the canals built by the Bureau of Reclamation and DWR, which are
 4 among the largest and most highly engineered water conveyance structures in the nation.

5 Diversion structures include weirs, either steel or wood, such as the fish protective facility at the
 6 Clifton Court Forebay. Pumping facilities of varying sizes are used to move water from where it is in
 7 excess to where it is needed. These range from the massive plants at Banks and Tracy Pumping
 8 Plants, to the mid-sized Middle River pumping plant, and to the single pumps that line the levees
 9 throughout the study area. Conduits such as canals, flumes, tunnels, and pipelines used to convey
 10 water are found throughout the study area. They range from simple dirt-lined ditches found on
 11 virtually every agricultural parcel to the three pipelines that make up the massive Mokelumne
 12 Aqueduct. Smaller pipelines with siphons, penstocks, gates, valves or other distribution and
 13 regulation structures are found throughout the study area.

14 **18.1.7.6 Transportation**

15 One of the direct results of settlement was the development and improvement of the transportation
 16 infrastructure in the Delta. During the nineteenth and early twentieth centuries, several railroads
 17 were constructed through the region, roads were improved, and bridges were constructed to ensure
 18 efficient delivery of produce grown in the Delta region to major markets.

19 **Railroads**

20 Railroads were important in the creation and economic success of many Delta towns. Relevant
 21 railroad systems in the Delta include the Southern Pacific Railroad; Atchison, Topeka, and Santa Fe
 22 Railway; San Pablo and Tulare Railroad; Sacramento Southern Railroad; Oakland East Bay and
 23 Antioch Railroad; and Electric Northern Railroad. The Atchison, Topeka, and Santa Fe Railway line,
 24 originally constructed in the late 1890s, now carries the Burlington Northern & Santa Fe as well as
 25 Amtrak's *San Joaquin*. Running generally east from the Antioch area, the line passes between Bacon
 26 and Woodward Islands before crossing the Middle River Bridge, opened in 1929.

27 **Roads**

28 During the second half of the nineteenth century, early roads in the Delta were built over old trails
 29 that ran along the tops of river levees. One of the first public roads established in the Delta was
 30 Georgiana Road, which paralleled the east bank of the Sacramento River from Freeport to Walnut
 31 Grove and eventually to Sherman Island by 1870. Historic road alignments traverse the Delta and
 32 form one of the property types that may be affected by the project options.

33 **Bridges and Ferries**

34 Bridges have been an important element in the transportation network of the Delta since the
 35 nineteenth century. Because these bridges often cross navigable waterways, their builders were
 36 required by law to provide the means of accommodating river traffic, until recently by constructing
 37 movable bridges. This was true of highway bridges as well as railroad bridges. There are dozens of
 38 movable spans in the study area, most dating to the early decades of the twentieth century. These
 39 include single-leaf as well as double-leaf bascule bridges. They also include a large number of
 40 center-pivot swing bridges. Owing to the presence of numerous railroad and highway lines in the
 41 region, the Delta is home to the majority of all movable spans in California. Since the end of World

1 War II, the trend has been to construct high bridges that allow river traffic to pass without
2 interrupting highway traffic.

3 For less significant crossing, ferries were often built to carry automobile traffic over navigable
4 waters. Most of these were simple cable ferries, capable of carrying only a small number of vehicles
5 at a time. San Joaquin County operated as many as 16 ferries at one time. Several of them are still in
6 service including one connecting the Upper Jones Tract with Woodward Island, and the Empire
7 Tract-Venice Island Ferry. The California Department of Transportation also operated J-Mack ferry
8 operates on Highway 220 at Ryer Island and Howard's Landing.

9 **18.1.7.7 Utility Infrastructure**

10 The growth and development of towns throughout the Delta necessitated the development of utility
11 infrastructure. Documented historic-era utility infrastructure in the study area is related primarily
12 to electrical transmission (e.g., transmission lines, yards, substations). This infrastructure can be
13 found throughout the study area, with features and elements spanning the 1910s through the 1950s.

14 **18.1.7.8 Rural Historic Landscapes**

15 Cultural resources do not always consist of individual sites, buildings, structures, or features. They
16 can also encompass landscapes, including those in rural contexts, such as those found throughout
17 the Delta. According to the National Park Service *National Register Bulletin 18* (National Park Service
18 1987) a *rural historic landscape* is defined as:

19 a geographical area that historically has been used by people, or shaped or modified by human
20 activity, occupancy, or intervention, and that possesses a significant concentration, linkage, or
21 continuity of areas of land use, vegetation, buildings and structures, roads and waterways, and
22 natural features. Rural landscapes commonly reflect the day-to-day occupational activities of people
23 engaged in traditional work such as mining, fishing, and various types of agriculture. Often, they have
24 developed and evolved in response to both the forces of nature and the pragmatic need to make a
25 living.

26 Such landscapes have been identified and evaluated in the Delta. The most notable example is Bacon
27 Island; the entire island has been designated an NRHP-eligible Rural Historic District. Although
28 large-scale agriculture is clearly still the predominant industry and way of life in the Delta, the
29 social, ethnic, technological, and economic context has changed dramatically since the early 1900s,
30 and few such complexes retaining a high degree of historical integrity have been recorded in the
31 Delta. Rural historic landscapes can include constituent elements of all the various property types
32 from the historic era. Rural historic landscapes can qualify as historic properties (National Park
33 Service 1987:24).

34 **18.1.8 Historic Archaeological Property Types**

35 Previous studies in the vicinity of the Plan Area provide reasonable expectations of the range of
36 historic archaeological property types relevant to the study area. These property types are classified
37 here in terms of function. Intensive historic-era use of waterways within the Plan Area coincides
38 with the discovery of gold in 1848. The sudden influx of fortune seekers resulted in heavy use of
39 waterways within the Plan Area for transportation of individuals and supplies. To accommodate the
40 surge, cities and towns were established along the rivers. Both small- and large-scale mining
41 endeavors were carried out in the Plan Area vicinity along the Feather, Bear, Yuba, and American
42 Rivers. Agricultural endeavors followed quickly, and overland transportation routes were developed

1 that often paralleled waterways in the Plan Area. Historic archaeological resources within the Plan
2 Area are mostly related to these events. Six categories of historical archaeological property types
3 have been identified within the Plan Area and are described under separate headings below.

4 **18.1.8.1 Building Foundations**

5 This property type is typically related to either commercial or residential structures that have been
6 demolished or burned down. Foundation materials can include stacked rock, wood, brick and
7 mortar, and concrete. There are often associated structural remains such as plate glass, nails, and
8 other hardware in the vicinity. Associated domestic refuse deposits are common, as well as
9 subterranean wells and privy pits. In the Plan Area, many examples of this site type are associated
10 with farming and ranching.

11 **18.1.8.2 Refuse Scatters/Dumps**

12 This property type can range from a single dumping episode to an established community dump.
13 Associated artifacts include glass bottles and jars, ceramics, metal cans, and a multitude of other
14 domestic items. Many examples of this site type represent the remnants of labor camps and
15 townsites.

16 **18.1.8.3 Transportation-Related Features**

17 This property type includes roads, railroads, and landings for water vessels. Roads and railroad lines
18 were often established on the crown of levees that parallel waterways in the Plan Area. Public
19 landings were often established for towns, but many were associated with private properties.
20 Landings associated with private property were typically used for loading and unloading of
21 materials and livestock associated with agricultural endeavors.

22 **18.1.8.4 Water Conveyance Systems**

23 This property type consists of both small-scale systems, such as ditches, canals, and pump house
24 foundations, and large-scale systems, such as levees, sloughs, and weirs. Small-scale water
25 conveyance systems are typically associated with irrigation for agricultural endeavors.

26 **18.1.8.5 Historic Isolates**

27 Isolated finds are three or fewer artifacts that occur within a restricted spatial context, generally
28 within an area 30 feet in diameter. Information potential usually is limited to location, material type,
29 style, and function of the individual artifact.

30 **18.1.8.6 Maritime/Riverine Property Types**

31 The variety of riverine and maritime resources in the Plan Area provides a reasonable prediction of
32 the range of maritime/riverine property types that may be affected by the action alternatives. These
33 property types are classified here in terms of function because of the wide variation in form.
34 Maritime/riverine resources are typically associated with historic-era activities, although there is a
35 small possibility of submerged prehistoric resources. Use of the waterways in the Plan Area for
36 commercial, military, and recreational endeavors has been intensive since the 1840s, resulting, for
37 various reasons, in numerous maritime/riverine properties. Previous cultural resources studies in
38 the Plan Area have identified a few maritime/riverine property types. Maritime/riverine resource

1 property types include the remains of landings, pilings, and modern and historic vessels. Each
2 property type is described under a separate heading below.

3 **Landings**

4 This property type includes wooden structures used for docking vessels to load and unload people,
5 livestock, and materials. Public landings were often established for towns, but many were associated
6 with private properties. Landings associated with private property were typically used for loading
7 and unloading materials associated with agricultural endeavors. As overland transportation became
8 more common, use of the waterways declined and landings fell into disrepair, often resulting in their
9 collapse into the water.

10 **Pilings**

11 This property type was often associated with landings or structures built along the riverfront.
12 Pilings are wood or concrete poles driven into the river bottom to support the associated structure,
13 but they were sometimes used individually for the mooring of vessels. Many pilings in the Plan Area
14 have fallen into disrepair and sunk, although some are intact and being used for mooring.

15 **Vessels**

16 A wide range of submerged vessels dating from the 1840s to the present can be found in the Plan
17 Area. The earliest vessel types included small and large sailing vessels and barges, typically with
18 wooden hulls and metal hardware. These vessels were usually associated with commercial
19 endeavors because recreational boating was not common until the 1930s. Wooden barges in the
20 Plan Area were typically “dumb” barges (i.e., no built-in means of propulsion) and were used for
21 transporting produce while tethered to a wind- or steam-powered vessel. Steel hulls became more
22 prominent after the 1860s and are typically steamboats, barges, fishing vessels, or military vessels.
23 Modern vessels are most often recreational and are made of fiberglass and wood or steel composite.

24 **18.1.9 Identified Resources and Action Alternatives**

25 Appendix 18B, *Identified Resources Potentially Affected by the BDCP Alternatives*, describes identified
26 cultural resources affected by the alternatives under consideration. These resources were identified
27 through record searches at the various regional offices of the CHRIS as well as historical map
28 research and field inventory efforts for built-environment resources. Appendix 18B identifies which
29 resources occur in each of the alternatives, and resources that are unique to specific alternatives.
30 This set of identified resources provides a sample used to predict the sensitivity of these rights-of-
31 way for additional cultural resources, and indicates that all action alternatives are sensitive for
32 archaeological and built-environment resources. Appendix 18A, *Archaeological Resources Sensitivity*
33 *Assessment*, provides a further analysis of the sensitivity of the Plan Area for buried archaeological
34 resources based on land forms and geological processes.

18.2 Regulatory Setting

18.2.1 Federal Plans, Policies, and Regulations

18.2.1.1 National Environmental Policy Act

NEPA establishes the federal policy of preserving important historic, cultural, and natural aspects of our national heritage during federal project planning. All federal or federally assisted projects requiring action pursuant to Section 102 of the act must take into account impacts on cultural resources (42 USC Sections 4321–4347).

The Council on Environmental Quality (CEQ) Guidelines provided a standard for determining the significance of impacts analyzed under NEPA. *Significance* as used in NEPA requires considering impacts in terms of both context and intensity (40 CFR 1508.27).

- *Context* means that the action must be analyzed in terms of society as a whole, the affected region and interests, and the local setting. The span of the context should be scaled to match the action. For larger actions a wider context is appropriate. For smaller site-specific actions the local context may be sufficient. Both the short- and long-term impacts of an action are relevant to this analysis (40 CFR 1508.27[a]).
- *Intensity* means the severity of an impact. The CEQ Guidelines direct federal agencies to consider cultural resources when evaluating intensity. Specific factors that may affect the intensity of an impact include the proximity to historical or cultural resources, the potential for impacts on NRHP-eligible or listed properties and the potential for loss or destruction of significant scientific, cultural, or historical resources (40 CFR 1508.27[b]).

These considerations mean that NEPA analysis should identify the potential for an action to adversely affect resources that are or may be eligible for listing on the NRHP. It should be noted that some federal agencies, such as the Corps, follow 33 CFR Part 325, Appendix C. The substance of these regulations generally follows 36 CFR Part 800.

18.2.1.2 Section 106 of the National Historic Preservation Act of 1966

Section 106 of the NHPA (“Section 106”) requires federal agencies to consider the effects of their actions on historic properties (16 USC Section 470f). *Historic properties* are resources listed on or eligible for listing on the NRHP (36 CFR 800.16[l][1]). A property may be listed in the NRHP if it meets criteria provided in the NRHP regulations (36 CFR 60.4). Typically properties must also be 50 years old or greater (36 CFR 60.4[d]).

- The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association (further discussed below in Section 18.2.2.1) and:
 - (A) That are associated with events that have made a significant contribution to the broad patterns of our history; or
 - (B) That are associated with the lives of persons significant in our past; or

- 1 (C) That embody the distinctive characteristics of a type, period, or method of construction, or
 2 that represent the work of a master, or that possess artistic value, or that represent a
 3 significant and distinguishable entity whose components may lack individual distinction; or
 4 (D) That have yielded, or may be likely to yield, information important in prehistory or history.

5 Some property types do not typically qualify for the NRHP, however these properties may qualify if
 6 they fall into one or more of the following criteria considerations. These considerations consist of
 7 the following (36 CFR 60.4).

- 8 • A religious property deriving primary significance from architectural or artistic distinction or
 9 historical importance (a); or
- 10 • A building or structure removed from its original location but which is significant primarily for
 11 architectural value, or which is the surviving structure most importantly associated with a
 12 historic person or event (b); or
- 13 • A birthplace or grave of a historical figure of outstanding importance if there is no appropriate
 14 site or building directly associated with his productive life (c).
- 15 • A cemetery which derives its primary significance from graves of persons of transcendent
 16 importance, from age, from distinctive design features, or from association with historic events
 17 (d); or
- 18 • A reconstructed building when accurately executed in a suitable environment and presented in a
 19 dignified manner as part of a restoration master plan, and when no other building or structure
 20 with the same association has survived (e); or
- 21 • A property primarily commemorative in intent if design, age, tradition, or symbolic value has
 22 invested it with its own exceptional significance (f); or
- 23 • A property achieving significance within the past 50 years if it is of exceptional importance (g).

24 The Section 106 review process typically consists of the following major steps.

- 25 • Identify the federal agency undertaking.
- 26 • Initiate Section 106 process.
- 27 • Identify an area of potential effects, and within these limits, identify historic properties.
- 28 • Assess adverse effects.
- 29 • Resolve adverse effects (typically through treatment, avoidance, preservation, or other
 30 mechanisms identified by the lead agency in consultation with SHPO and interested parties).

31 The Section 106 regulations define an adverse effect as an effect that alters, directly or indirectly, the
 32 qualities that make a resource eligible for listing in the NRHP (36 CFR 800.5[a][1]). Consideration
 33 must be given to the property's location, design, setting, materials, workmanship, feeling, and
 34 association, to the extent that these qualities contribute to the integrity and significance of the
 35 resource. Adverse effects may be direct and reasonably foreseeable, or may be more remote in time
 36 or distance (36 CFR 8010.5[a][1]).

37 Under section 304(a) of the National Historic Preservation Act, "[t]he head of a Federal agency ...
 38 shall withhold from disclosure to the public, information about the location, character, or ownership

1 of a historic resource if the Secretary and the agency determine that disclosure may ... risk harm to
2 the historic resources ...”

3 **18.2.1.3 Compliance with Section 106 of the National Historic Preservation** 4 **Act for the BDCP**

5 Section 106 review will be performed for relevant federal actions that qualify as undertakings and
6 that are necessary to implement the BDCP. Phased identification and evaluation of cultural
7 resources will be completed as authorized by 36 CFR 800.4(b)(2) and 36 CFR 800.14(b)(1). The
8 phased completion of these steps will be accomplished by a programmatic agreement (PA) covering
9 federal agency responsibilities under the NHPA. This PA will require Reclamation, USACE, USFWS
10 and NMFS to complete the management steps required under Section 106 for all future
11 undertakings necessary to implement the BDCP. For each undertaking the agencies shall:

- 12 ● Identify the area in which historic properties may be affected.
- 13 ● Complete an inventory for historic properties.
- 14 ● Evaluate identified resources to determine if they are historic properties.
- 15 ● Determine if the undertaking will adversely affect those properties.
- 16 ● Resolve adverse effects.

17 These steps will be completed in consultation with the SHPO and Indian Tribes, the ACHP, and other
18 interested parties that choose to participate in the Section 106 process.

19 **18.2.1.4 Native American Graves Protection and Repatriation Act**

20 The Native American Graves Protection and Repatriation Act (NAGPRA) provides a process for
21 federal agencies to determine custody of Native American cultural items to lineal descendants and
22 culturally affiliated Indian tribes. NAGPRA defines the ownership of Native American human
23 remains and funerary materials excavated on lands owned or controlled by the federal government.
24 NAGPRA establishes a hierarchy of ownership rights for Native American remains identified on
25 these lands (25 USC Section 3002[a]):

- 26 ● Where the lineal descendants can be found, the lineal descendants own the remains.
- 27 ● Where the lineal descendants cannot be found, the remains belong to the Indian tribe or Native
28 Hawaiian organization on whose land the remains were found.
- 29 ● If the remains are discovered on other lands owned or controlled by the federal government and
30 the lineal descendants cannot be determined, the remains belong to the Indian tribe or Native
31 Hawaiian organization that is culturally affiliated with the remains, or the tribe that aboriginally
32 occupied the land where the remains were discovered.

33 Under NAGPRA intentional excavation of Native American human remains on lands owned or
34 controlled by the federal government may occur (25 USC Section 3002[c]) only under the following
35 circumstances.

- 36 ● With a permit issued under the Archaeological Resources Protection Act (16 USC Section 470cc);
37 and;
- 38 ● After documented consultation with the relevant tribal or Native American groups.

- Ownership and disposition follows NAGPRA for all human remains and associated artifacts (25 US Code Section 3001 and 43 CFR Section 10.6).

NAGPRA also provides guidance on inadvertent discoveries of Native American or Hawaiian human remains on lands owned or controlled by the federal government. When an inadvertent discovery on these lands occurs in association with construction, construction must cease. The party that discovers the remains must notify the relevant federal agency, and the remains must be transferred according to the ownership provisions above (25 USC Section 3002[d]).

18.2.1.5 The Archaeological Resources Protection Act

The Archaeological Resources Protection Act (ARPA) requires a permit for intentional excavation of archaeological materials on federal lands (16 USC Section 470ee[a]). The federal agency that owns or controls the land may dispense permits for excavation as provided in the ARPA regulations (43 CFR 7.5). The permit may require notice to affected Indian tribes (43 CFR 7.7), and compliance with the terms and conditions provided in the ARPA regulations (43 CFR 7.9). While few federal lands occur in the study area, it should be noted that work on federal lands and collections retrieved from federal lands are subject to ARPA.

18.2.2 State Plans, Policies, and Regulations

18.2.2.1 California Environmental Quality Act – Statute and Guidelines

CEQA requires the lead agency to consider the effects of a project on cultural resources. Two categories of cultural resources are specifically identified in the State CEQA Guidelines; historical resources (State CEQA Guidelines Section 15064.5[b]) and unique archaeological sites (State CEQA Guidelines 15064.5[c] and California Public Resources Code (PRC) Section 21083.2). Different legal rules apply to the two different categories of cultural resources, though the two categories sometimes overlap where a “unique archaeological resource” also qualifies as an “historical resource.” In such an instance, the more stringent rules for archaeological resources that are historical resources apply, as explained below. CEQA and other California laws also set forth special rules for dealing with human remains that might be encountered during construction.

Historical resources are those meeting the requirements listed below.

- Resources listed in or determined eligible for listing in the CRHR (State CEQA Guidelines Section 15064.5[a][1]). Note that CRHR-eligible resources include resources listed on or eligible for the NRHP (California PRC Section 5024.1);
- Resources included in a local register as defined in California PRC Section 5020.1(k), “unless the preponderance of evidence demonstrates” that the resource “is not historically or culturally significant.” (State CEQA Guidelines Section 15064.5[a][2]);
- Resources that are identified as significant in surveys that meet the standards provided in California PRC Section 5024.1[g] (State CEQA Guidelines Section 15064.5[a][3]); or
- Resources that the lead agency determines are significant, based on substantial evidence (State CEQA Guidelines Section 15064.5[a][3]).

Cultural resources may be listed in the CRHR if they have historical significance and integrity.

- Cultural resources are significant if they meet any of the following criteria:

- 1 1. Are associated with events that have made a significant contribution to the broad patterns
2 of California's history and cultural heritage, or the United States (California Code of
3 Regulations [CCR], Title 14, Section 4852[b][1]),
- 4 2. Are associated with the lives of persons important in our past (14 CCR Section 4852[b][2]),
- 5 3. Embody the distinctive characteristics of a type, period, region, or method of construction,
6 or represent the work of an important creative individual, or possess high artistic values (14
7 CCR Section 4852[b][3]), or;
- 8 4. Yield, or may be likely to yield, information important in prehistory or history (14 CCR
9 Section 4852[b][4]).

10 Integrity for built-environment resources means the "survival of characteristics that existed during
11 the resource's period of significance. Integrity must also be assessed in relationship to the particular
12 criterion under which a resource has significance. For example, even where a resource has "lost its
13 historic character or appearance [it] may still have sufficient integrity for the California Register if it
14 maintains the potential to yield significant scientific or historical information or specific data."
15 Integrity is further defined as the ability to "convey the reasons" for the significance of the resource
16 (14 CCR Section 4852[c])

17 For archaeological sites, this language therefore means that a site must have a likelihood of yielding
18 useful information for research in order to have integrity, if the site is significant for its data
19 potential.

20 The fact that a resource is not listed in, or determined to be eligible for listing in the California
21 Register of Historic Resources, not included in a local register of historical resources, or identified in
22 an historical resource survey does not preclude a CEQA lead agency from determining that the
23 resource *may* be an historical resource as defined in California PRC Section 5020.1(j) or 5024.1
24 (State CEQA Guidelines Section 15064.5[a][4]).

25 Notably, a project that causes a substantial adverse change in the significance of an historical
26 resource is a project that may have significant impact under CEQA (State CEQA Guidelines Section
27 15064.5[b]). A substantial adverse change in the significance of an historical resource means
28 physical demolition, destruction, relocation, or alteration of the resource or its immediate
29 surroundings such that the significance of the historical resource would be materially impaired. The
30 significance of an historical resource is materially impaired if the project demolishes or materially
31 alters any qualities that justify the:

- 32 ● inclusion or eligibility for inclusion of a resource on the CRHR (State CEQA Guidelines Section
33 15064.5[b][2][A],[C]).
- 34 ● inclusion of the resource on a local register (State CEQA Guidelines Section 15064.5[b][2][B]).

35 *Unique archaeological resources*, on the other hand, are defined in California PRC Section 21083.2 as
36 a resource that meets at least one of the following criteria.

- 37 ● Contains information needed to answer important scientific research questions and there is a
38 demonstrable public interest in that information.
- 39 ● Has a special and particular quality such as being the oldest of its type or the best available
40 example of its type.

- Is directly associated with a scientifically recognized important prehistoric or historic event or person (California PRC Section 21083.2[g])

Integrity Considerations For Historic-Era Built-Environment Resources

Integrity in this context is the authenticity of a historic resource's physical characteristics so that it is recognizable as a historic resource and retains its ability to convey its historical associations or attributes. The evaluation of integrity is grounded in the evaluator's understanding of a property's physical features and how these features relate to its historical associations or attributes. Associations and attributes for properties found in the Delta have been summarized in Section 18.1.6 *Historic-Era Setting* and Section 18.1.7, *Historic-Era Property Types*.

Both the CRHR and NRHP define the following seven aspects of integrity.

- **Location:** where the historic property was constructed or the place where the historic event occurred.
- **Design:** the combination of elements that create the historic form, plan, space, structure, and style of a property. This includes organization of space, proportion, scale, technology, ornamentation, and materials. This is applicable to larger properties for the historic way in which the buildings, sites, and structures are related.
- **Setting:** the physical environment of a historic property. It refers to the historic character of the property. It includes the historical relationship of the property to surrounding features and open space. These include topographic features, vegetation, simple manmade paths or fencing and the relationships between buildings, structures or open space.
- **Materials:** the physical elements that were combined during a particular period of time and in a particular pattern or configuration to form the historic property.
- **Workmanship:** the physical evidence of the crafts of a particular culture or people during a given period in history. It may be expressed in vernacular methods of construction and plain finishes or in highly sophisticated configuration and ornamental detailing.
- **Feeling:** the property's expression of the aesthetic or historic sense of a particular period of time. It results from the presence of physical features that, taken together, convey the property's historic character.
- **Association:** the direct link between an important historic event or person and a historic property. A property retains association if it is the place where the event or activity occurred and is sufficiently intact to convey that relationship to an observer. Like feeling, association requires the presence of physical features that convey a property's historic character.

The Delta contains a large variety of built resources, from levees to communities, spanning a period from about 1850 to present. When considering integrity, properties that are rare or are early examples of built resources in the region are eligible under different criteria, but still maintain integrity for the characteristics that make it eligible for listing in the register. Delta-style houses, some of the earliest residential building in the region, are one such property type because they are particular to the region, having been designed in response to that environment and, due to their age and modest origins, are more likely to have been subject to incongruous alterations over the years or poorly maintained than the grander late 19th century – 1920s farming estates or river-front homes.

1 Integrity conclusions for large agricultural properties are complex in that these properties have
2 multiple associated features to consider and were likely developed over time in response to
3 technological advances, changes in land use, and changes in number of residents. When determining
4 integrity for this kind of property, the architectural historian looked at the property as a whole and
5 determined which resources would be contributors to the property and which would be of primary
6 importance to the property's significance. For example, an agricultural property may have altered
7 residences, new outbuildings, an altered barn, and a shed that appears to be original or not altered
8 in the last 45 years. Based on the ubiquitous nature of sheds in rural landscapes, it is unlikely that
9 the shed would be individually eligible. Due to the property's majority of altered and newly built
10 resources, it will have been determined to lack integrity. If insufficient primary buildings, such as the
11 main residence or major agriculture-related buildings such as barns were not visible from the public
12 right-of-way, the property as a whole was listed as being insufficiently accessible and no
13 determination could be made.

14 Properties such as the islands/reclamation districts or railroads that are subject to heavy use or
15 gradual impacts from environmental stresses have to be maintained to continue to be useable. Some
16 materials and structures on the islands may have to be replaced, such as pumps and pipes, or
17 reinforced, such as the levees, Railroad ties rot and have to be replaced. The historic use of the island
18 is maintained and the alignment and grade of the railroad is unaltered, which are the over-arching
19 historic features of these kinds of properties. Accordingly, ongoing repair and replacement of
20 individual components of the resource may be consistent with the character and significance of the
21 resource. These factors are considered when determining levels of integrity.

22 If a property known to be 45 years old or more appears to have been significantly altered within the
23 last 45 years, such that it no longer retains character-defining elements, and so that it is
24 recognizable as a historic resource, and no longer retains its ability to convey its historical
25 associations or attributes, it is considered to not have adequate historic integrity.

26 While integrity can be somewhat subjective, the following are alterations commonly seen in Delta
27 buildings.

- 28 ● Windows have been replaced with inconsistent window types, such as aluminum or vinyl;
- 29 ● Window openings have been changed, enclosed, or new opening have been made;
- 30 ● Siding has been replaced with a substitute material, such as vinyl, aluminum, stucco;
- 31 ● Rooflines have been changed;
- 32 ● Doors have been replaced with new doors inconsistent with the original in style and/or
33 material;
- 34 ● Door openings have been altered, enlarged, or moved;
- 35 ● Ornamentation characteristic to specific architectural styles has been added or removed;
- 36 ● Additions, particularly those out of scale or otherwise inconsistent in materials, form or
37 massing.

38 These considerations were taken into account when conducting field surveys and when assessing
39 effects.

1 Mitigation Requirements for Archaeological Resources Qualifying As Historical 2 Resources

3 As set forth in State CEQA Guidelines Section 15064.5[c], special rules apply where a lead agency is
4 not certain at first whether an archaeological resource qualifies as either an “historical resource” or
5 a “unique archaeological resource.” That section provides that “[w]hen a project will impact an
6 archaeological site, a lead agency shall first determine whether the site is an historical resource[.]”
7 “If a lead agency determines that the archaeological site is an historical resource,” the resource shall
8 be subject to the rules set forth above regarding historical resources. In addition, according to State
9 CEQA Guidelines Section 15126.4[b]

10 [p]ublic agencies should, whenever feasible, seek to avoid damaging effects on any historical
11 resource of an archaeological nature. The following factors shall be considered and discussed in
12 an EIR for a project involving such an archaeological site:

13 (A) Preservation in place is the preferred manner of mitigating impacts to archaeological sites.
14 Preservation in place maintains the relationship between artifacts and the archaeological
15 context. Preservation may also avoid conflict with religious or cultural values of groups
16 associated with the site.

17 (B) Preservation in place may be accomplished by, but is not limited to, the following:

- 18 1. Planning construction to avoid archaeological sites;
- 19 2. Incorporation of sites within parks, greenspace, or other open space;
- 20 3. Covering the archaeological sites with a layer of chemically stable soil before building
21 tennis courts, parking lots, or similar facilities on the site.
- 22 4. Deeding the site into a permanent conservation easement.

23 Thus, although California PRC Section 21083.2, in dealing with “unique archaeological sites,”
24 provides for specific mitigation options “in no order of preference,” CEQA Guidelines Section
25 15126.4[b], in dealing with “historical resources of an archaeological nature,” provides that
26 “[p]reservation in place is the preferred manner of mitigating impacts to archaeological sites.”

27 For archaeological resources that qualify as historical resources, “data recovery” is a disfavored
28 form of mitigation compared with “preservation in place.” Yet “[w]hen data recovery through
29 excavation is the only feasible mitigation, a data recovery plan, which makes provisions for
30 adequately recovering the scientifically consequential information from and about the historical
31 resource, shall be prepared and adopted prior to any excavation being undertaken. Such studies
32 shall be deposited with the California Historical Resources Regional Information Center.” Moreover,
33 “[i]f an artifact must be removed during project excavation or testing, curation may be an
34 appropriate mitigation” (State CEQA Guidelines Section 15126.4[b][3][C]). “Data recovery shall not
35 be required[, however,] for an historical resource [as with a unique archaeological resource] if the
36 lead agency determines that testing or studies already completed have adequately recovered the
37 scientifically consequential information from and about the archaeological or historical resource,
38 provided that the determination is documented in the EIR and that the studies are deposited with
39 the California Historical Resources Regional Information Center” (State CEQA Guidelines Section
40 15126.4[b][3][D]).

41 With respect to *both* historical resources and unique archaeological resources

42 a lead agency should make provisions for...resources accidentally discovered during construction.
43 These provisions should include an immediate evaluation of the find by a qualified archaeologist. If

1 the find is determined to be an historical or unique archaeological resource, contingency funding and
 2 a time allotment sufficient to allow for implementation of avoidance measures or appropriate
 3 mitigation should be available. Work could continue on other parts of the building site while
 4 historical or unique archaeological resource mitigation takes place (State CEQA Guidelines Section
 5 15064.5[f])

6 **Mitigation for Unique Archaeological Resources**

7 If a lead agency determines that “an archaeological site does *not* meet the criteria” for qualifying as
 8 an historical resource “but does meet the definition of a unique archeological resource..., the site
 9 shall be treated in accordance with the provisions of section 21083.2” (described above). Section
 10 21083.2 contains the special rules for mitigation for “unique archaeological resources.” These rules
 11 do not apply if the archaeological resource is an historical resource (State CEQA Guidelines Section
 12 15064.5[c][1]). The CEQA Statute states that

13 [i]f it can be demonstrated that a project will cause damage to a unique archaeological resource, the
 14 lead agency may require reasonable efforts to be made to permit any or all of these resources to be
 15 preserved in place or left in an undisturbed state. Examples of that treatment, in no order of
 16 preference, may include, but are not limited to, any of the following:

- 17 1. Planning construction to avoid archaeological sites.
- 18 2. Deeding archaeological sites into permanent conservation easements.
- 19 3. Capping or covering archaeological sites with a layer of soil before building on the sites.
- 20 4. Planning parks, greenspace, or other open space to incorporate archaeological sites.

21 Excavation as mitigation shall be restricted to those parts of the unique archaeological resource that
 22 would be damaged or destroyed by the project. Excavation as mitigation shall not be required for a
 23 unique archaeological resource if the lead agency determines that testing or studies already
 24 completed have adequately recovered the scientifically consequential information from and about
 25 the resource, if this determination is documented in the environmental impact report. (California
 26 Public Resources Code Section 21083.2[d])

27 If, however, “an archaeological resource is neither a unique archaeological nor an historical
 28 resource, the effects of the project on those resources shall not be considered a significant effect on
 29 the environment. It shall be sufficient that both the resource and the effect on it are noted in the
 30 Initial Study or EIR, if one is prepared to address impacts on other resources, but they need not be
 31 considered further in the CEQA process” (State CEQA Guidelines, Section 15064.5[c][4]).

32 **18.2.2.2 California Public Resources Code, Duties of State Agencies**

33 California state agencies must provide the Office of Historic Preservation an inventory of all state-
 34 owned structures older than 50 years of age under its jurisdiction that are listed in or that may be
 35 eligible for inclusion in the NRHP or are registered or that may be eligible for registration as a state
 36 historical landmark (California PRC Section 5024[a]). The Office of Historic Preservation compiles
 37 these lists into a master list (California PRC Section 5024[d]).

38 State agencies must provide notice to the State Historic Preservation Officer early in the planning
 39 process if the agency intends to alter or demolish resources on the master list (California PRC
 40 Section 5024.5[a]). The State Historic Preservation Officer has 30 days to respond after receiving
 41 notice. If the State Historic Preservation Officer determines that the action will have an adverse
 42 effect on a listed historical resource, the agency must adopt prudent and feasible measures to
 43 mitigate or eliminate the adverse effects (California PRC Section 5024.5[b]).

18.2.2.3 Discoveries of Human Remains under California Environmental Quality Act Public Law

California law sets forth special rules that apply where *human remains* are encountered during project construction. These rules are set forth in one place in State CEQA Guidelines, Section 15064.5[e] as follows:

In the event of the accidental discovery or recognition of any human remains in any location other than a dedicated cemetery, the following steps should be taken:

(1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:

(A) The coroner of the county in which the remains are discovered must be contacted to determine that no investigation of the cause of death is required (as required under California Health and Safety Code Section 7050.5).

(B) If the coroner determines the remains to be Native American:

1. The coroner shall contact the Native American Heritage Commission within 24 hours.
2. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American.
3. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods (as provided in Public Resources Code Section 5097.98), or

(2) Where the following conditions occur, the landowner or his authorized representative shall rebury the Native American human remains and associated grave goods with appropriate dignity on the property in a location not subject to further subsurface disturbance.

(A) The Native American Heritage Commission is unable to identify a most likely descendent or the most likely descendent failed to make a recommendation within 24 hours after being notified by the commission.

(B) The descendant identified fails to make a recommendation; or

(C) The landowner or his authorized representative rejects the recommendation of the descendant, and the mediation by the Native American Heritage Commission fails to provide measures acceptable to the landowner.

18.2.2.4 California Native American Graves Protection and Repatriation Act

Sections 8010–8011 of the California Health and Safety Code establish a state repatriation policy that is consistent with and facilitates implementation of NAGPRA. The policy requires that all California Indian human remains and cultural items be treated with dignity and respect and encourages voluntary disclosure and return of remains and cultural items by publicly funded agencies and museums in California. The policy provides for mechanisms to aid California Indian tribes, including non–federally recognized tribes, in filing repatriation claims and getting responses to those claims.

18.2.2.5 Confidentiality Considerations

CEQA and the California Public Records Act restrict the amount of information regarding cultural resources that can be disclosed in an EIR in order to avoid the possibility that such resources could

1 be subject to vandalism or other damage (*Clower Valley Foundation v. City of Rocklin* (2011) 197
2 Cal.App.4th 200, 219). The State CEQA Guidelines prohibit an EIR from including “information about
3 the location of archaeological sites and sacred lands, or any other information that is subject to the
4 disclosure restrictions of Section 6254 of the Government Code [(part of the California Public
5 Records Act)].” (State CEQA Guidelines, § 15120, subd. (d)). In turn, California Government Code
6 section 2654 of the California Public Records Act lists as exempt from public disclosure any records
7 “of Native American graves, cemeteries, and sacred places and records of Native American places,
8 features, and objects described in Sections 5097.9 and 5097.933 of the [California] Public Resources
9 Code maintained by, or in the possession of, the Native American Heritage Commission, another
10 state agency, or a local agency.” (Cal. Gov. Code, § 6254, subd. (r)).

11 California Public Resources Code sections 5097.9 and 5097.993 list the Native American places,
12 features, and objects, the records of which are not to be publically disclosed under the California
13 Public Records Act: “any Native American sanctified cemetery, places of worship, religious or
14 ceremonial site, or sacred shrine located on public property (§ 5097.9) and any “Native American
15 historic, cultural, or sacred site, that is listed or may be eligible for listing in the California Register of
16 Historic Resources ..., including any historic or prehistoric ruins, any burial ground, any
17 archaeological or historic site, any inscriptions made by Native Americans at such a site, any
18 archaeological or historic Native American rock art, or any archaeological or historic feature of a
19 Native American historic, cultural, or sacred site ...” (§5097.993, subd. (a)(1)).

20 The California Public Resources Act also generally prohibits disclosure of archaeological records.
21 Government Code section 6254.10 provides: “Nothing in [the California Public Records Act] requires
22 disclosure of records that relate to archaeological site information and reports maintained by, or in
23 the possession of ... a local agency, including the records that the agency obtains through a
24 consultation process between a California Native American tribe and a state or local agency.”

25 These authorities prohibit the disclosure of records and information concerning certain of the Delta
26 region’s archeological, cultural, and historic resources in this Draft EIS/EIR. The lead agencies
27 believe confidentiality of the site locations of certain archaeological, cultural, and historic resources
28 found in the region is necessary to prevent vandalism to the resources. Public release of information
29 on the sites may allow their discovery by trespassers, leading to potential looting. The lead agencies’
30 position is consistent with the intent of National Historic Preservation Act Section 304(a):

31 The head of a Federal agency ... shall withhold from disclosure to the public, information about the
32 location, character, or ownership of a historic resource if the Secretary and the agency determine
33 that disclosure may ... risk harm to the historic resources ...”

34 As a result, specific descriptions of certain of the archeological, cultural, and historic resources are
35 not provided in this chapter. For the preservation of the sites, specific information on the locations
36 and nature of findings at the resources cannot be included in the CEQA documents. Site-specific
37 content and location information will be reviewed by appropriate federal and state agency officials
38 on a need-to-know basis, thereby protecting the confidential information regarding location and
39 content of the sites. The lead agencies believe protecting the confidentiality of certain information
40 concerning the location and nature of the resources from public disclosure is the best way to
41 preserve the integrity of the valuable resources within the Delta region.

18.2.3 Regional and Local Plans, Policies, and Regulations

18.2.3.1 City and County General Plans

Many of the counties and cities encompassing lands in the Plan Area have developed policies and goals intended to document and preserve cultural resources in their areas. These general plans specify locally proposed goals or objectives and policies intended to enforce them and act as performance standards.

18.2.3.2 Alameda County

East County Area Plan

Land use planning in the eastern portion of Alameda County is governed by the East County Area Plan (ECAP), which was adopted by the County in May 1994. In November 2000, the Alameda County electorate approved Measure D, the Save Agriculture and Open Space Lands Initiative, which amended portions of the general plan, including the ECAP (Alameda County 2000).

The Open Space Element addresses sensitive lands and regionally significant open space, including cultural resources. Goals and policies from the ECAP related to protection of cultural resources that apply to the Plan Area are listed below (Alameda County 2000).

- **Goal:** To protect cultural resources from development.
 - **Policy 136:** The County shall identify and preserve significant archaeological and historical resources, including structures and sites which contribute to the heritage of East County.
 - **Policy 137:** The County shall require development to be designed to avoid cultural resources or, if avoidance is determined by the County to be infeasible, to include appropriate mitigation measures that offset the impacts.

18.2.3.3 Contra Costa County

Contra Costa County General Plan

A comprehensive update to the Contra Costa County General Plan was adopted on January 18, 1991. Amendments to the general plan followed in 1996 and 2005 to reflect changes to the Land Use Map and the incorporation of the City of Oakley (Roche pers. comm.). The Open Space Element of the general plan addresses preservation of historical and cultural resources. The following goal and policy from the Open Space Element are considered applicable to implementation of the BDCP (Contra Costa County 2005).

- **Policy 9-31:** To identify and preserve important archaeological and historic resources within the County.
- **Policy 9-32:** Areas which have identifiable and important archaeological or historic significance shall be preserved for such uses, preferably in public ownership.

18.2.3.4 City of Lathrop

The Resource Management Element of the City of Lathrop General Plan (2004) identifies the following goals and policies encouraging protection of cultural resources for land development projects within the City's boundaries:

- **Policy 7.3:** Significant natural open space and cultural resources should be identified prior to development and incorporated into site-specific development project design.

- Archaeological and Cultural Resource Policies:

(1) Existing known archaeological and cultural resources are to be protected, beginning with the filing of an application for development in the immediate vicinity of such resources. The City shall follow the procedures set forth in Appendix K of CEQA Guidelines. Confidentiality shall be maintained between the City and developer to avoid vandalism or desecration of such resources. Alternatives for development design intended to protect cultural resources shall be reviewed by a Native American having competence in understanding and interpreting the importance of the resources and of the most desirable methods to assure their preservation.

(2) The potential loss of as yet unknown archaeological and cultural resources shall be avoided by close monitoring of the development process. The close proximity of properties intended for development to natural watercourses or to known archaeological or cultural resources shall be taken as a signal by the City and developer of a potential for unearthing unknown resources. In such cases, the City shall instruct the developers, construction foremen and City inspectors of the potential for damage to artifacts and sites, and provide written instructions requiring a halt to all excavation work in the event of any find until the significance of the find can be evaluated by competent archaeological and Native American specialists. The costs of such protection work shall be the responsibility of the developer.

18.2.3.5 City of Oakley

City of Oakley General Plan

The City of Oakley General Plan was adopted on December 16, 2002. The Open Space and Conservation Element of the general plan addresses protection and enhancement of environmental resources, including cultural resources, in the Sacramento–San Joaquin River Delta (Delta). The following goal and policy from the Open Space and Conservation Element are considered applicable to implementation of the BDCP (City of Oakley 2002).

- **Goal 6.4:** Encourage preservation of cultural resources within the Plan Area.
 - **Policy.6.4.1:** Preserve areas that have identifiable and important archaeological or paleontological significance.

18.2.3.6 Sacramento County

Sacramento County General Plan

The Sacramento County General Plan Update was adopted on November 9, 2011. The amended Conservation Element addresses protection of cultural resources. The following objective and

1 policies from the Conservation Element of the general plan are considered applicable to
 2 implementation of the BDCP (Sacramento County 2011).

- 3 • **Goal:** Promote the inventory, protection and interpretation of the cultural heritage of
 4 Sacramento County, including historical and archaeological settings, sites, buildings, features,
 5 artifacts and/or areas of ethnic historical, religious, or socioeconomic importance.
- 6 ○ **Objective:** Preserve structures such as buildings, bridges, or other permanent structures
 7 with architectural or historical importance to maintain contributing design.
- 8 • **Policy CO-164:** Structures having historical and architectural importance shall be
 9 preserved and protected.
- 10 • **Policy CO-165:** Refer projects involving structures or within districts having historical
 11 or architectural importance to the Cultural Resources Committee to recommend
 12 appropriate means of protection and mitigation.
- 13 • **Policy CO-166:** Development surrounding areas of historic significance shall have
 14 compatible design in order to protect and enhance the historic quality of the areas.
- 15 • **Policy CO-167:** When conducting planning studies, County Planning staff, shall
 16 encourage the adaptive reuse of historic resources when the original use is no longer
 17 feasible or allowed under proposed area planning efforts.
- 18 • **Policy CO-168:** County-owned historic and cultural resources shall be preserved and
 19 maintained, such that modifications, alterations, and rehabilitations are conducted in a
 20 manner that is consistent with the U.S. Secretary of the Interiors Standards for the
 21 Treatment of Historic Properties.

22 **18.2.3.7 City of Sacramento**

23 **City of Sacramento General Plan**

24 The City of Sacramento 2030 General Plan was adopted on March 3, 2009. The revised Historic and
 25 Cultural Resources Element of the general plan addresses preservation of historical and cultural
 26 resources and adaptive reuse of historic structures. The following goal and policies from the Historic
 27 and Cultural Resources Element are considered applicable to implementation of the BDCP (City of
 28 Sacramento 2009).

- 29 • **Goal HCR 2.1, Identification and Preservation of Historic and Cultural Resources:** Identify
 30 and preserve the City's historic and cultural resources to enrich our sense of place and our
 31 understanding of the City's prehistory and history.
- 32 ○ **HCR 2.1.2, Applicable Laws and Regulations:** The City shall ensure that City, State, and
 33 Federal historic preservation laws, regulations, and codes are implemented, including the
 34 California Historical Building Code and State laws related to archaeological resources, to
 35 ensure the adequate protection of these resources.
- 36 ○ **HCR 2.1.3, Consultation:** The City shall consult with the appropriate organizations and
 37 individuals (e.g., Information Centers of the CHRIS System, the NAHC, and Native American
 38 groups and individuals) to minimize potential impacts to historic and cultural resources.

- **HCR 2.1.15, Archaeological Resources:** The City shall develop or ensure compliance with protocols that protect or mitigate impacts to archaeological, historic, and cultural resources including prehistoric resources.

18.2.3.8 San Joaquin County

San Joaquin County General Plan

The San Joaquin County General Plan 2010 was adopted on July 29, 1992. The Resources Element contained in Volume 1 of the general plan addresses protection of heritage resources, including archaeological resources. The following objective and policies from the Resources Element are considered applicable to implementation of the BDCP (San Joaquin County 1992):

- **Objective 1:** To protect San Joaquin County's valuable architectural, historical, archaeological, and cultural resources.
 - **Policy 2:** Significant archaeological and historical resources shall be identified and protected from destruction. If evidence of such resources appears after development begins, an assessment shall be made of the appropriate actions to preserve or remove the resources.
 - **Policy 3:** No significant architectural, historical, archaeological or cultural resources shall be knowingly destroyed through County action.

18.2.3.9 Solano County

Solano County General Plan

The Solano County General Plan was adopted on August 5, 2008, and was subject to voter approval as Measure T on the November 4, 2008, ballot. Measure T was passed by the voters, thereby confirming the approval of the new general plan.

The Resources Chapter of the Solano County General Plan includes an Open Space Element that addresses preservation and protection of recreational, scenic, agricultural, and cultural resources. The following policy from the Open Space Element of the Resources Chapter is considered applicable to implementation of the BDCP (Solano County 2008).

- **Policy RS.P-38:** Identify and preserve important prehistoric and historic structures, features, and communities.

18.2.3.10 City of Stockton

City of Stockton General Plan

The City of Stockton General Plan includes a natural and cultural resources element with the following policies that addresses protection of cultural resources within the City (City of Stockton 2007):

- **NCR-3.5 Archaeological Resource Surveys:** Prior to project approval, the City shall require project applicant to have a qualified archeologist conduct the following activities: (1) conduct a record search at the Central California Information Center located at California State University Stanislaus and other appropriate historical repositories, (2) conduct field surveys where

1 appropriate, and (3) prepare technical reports, where appropriate, meeting California Office of
2 Historic Preservation Standards.

- 3 • **NCR-3.6 Discovery of Archaeological Resources:** Consistent with Stockton Municipal Code
4 Section 16-310.050, *Cultural Resources*, in the event that archaeological/paleontological
5 resources are discovered during site excavation, the City shall require that grading and
6 construction work on the project site be suspended until the significance of the features can be
7 determined by a qualified archaeologist/paleontologist. The City will require that a qualified
8 archeologist/paleontologist make recommendations for measures necessary to protect any site
9 determined to contain or constitute an historical resource, a unique archaeological resource, or
10 a unique paleontological resource or to undertake data recovery, excavation, analysis, and
11 curation of archaeological/paleontologist materials. City staff shall consider such
12 recommendations and implement them where they are feasible in light of project design as
13 previously approved by the City.
- 14 • **NCR-3.8 Discovery of Human Remains:** Consistent with Stockton Municipal Code Section 16-
15 310.050, If any human remains are discovered or recognized in any location on the project site,
16 there shall be no further excavation or disturbance of the site or any nearby area reasonably
17 suspected to overlie adjacent human remains until the county coroner is notified, and if the
18 remains are of prehistoric Native American origin, the NAHC is notified and the requirements of
19 California PRC Section 5097.98 are met.

20 **18.2.3.11 City of Rio Vista**

21 **City of Rio Vista General Plan**

22 The City of Rio Vista General Plan 2001 was adopted on July 18, 2002. The Resource Conservation
23 and Management Element of the general plan addresses conservation of resources, including
24 historical resources. The following goal and policy from the general plan are considered applicable
25 to implementation of the BDCP (City of Rio Vista 2002).

- 26 • **Goal 10.10:** To encourage preservation of the City's historic resources while enhancing their
27 value and economic life.
 - 28 ○ **Policy 10.10.C:** The City shall require that discretionary development projects identify
29 important historic, archaeological, and cultural sites and their contributing environment
30 from damage, destruction, and abuse. The City shall ensure that such assessments are
31 incorporated into the City's cultural and historical database, to be maintained by the Rio
32 Vista Museum.

33 **18.2.3.12 Yolo County**

34 **Yolo County General Plan**

35 The Yolo County General Plan was adopted on November 10, 2009. The general plan integrates, by
36 reference, locally effective parts of the Delta Protection Commission's Land Use and Resource
37 Management Plan for the Primary Zone of the Delta.

38 The Conservation and Open Space Element of the Yolo County General Plan addresses preservation
39 of various resources in an open space environment. The following policies from the general plan are
40 considered applicable to implementation of the BDCP (County of Yolo 2009a).

- 1 ● **Goal CO-4, Cultural Resources:** Preserve and protect cultural resources within the County.
- 2 ○ **Policy CO-4.1:** Identify and safeguard important cultural resources.
- 3 ○ **Policy CO-4.12:** Work with culturally affiliated tribes to identify and appropriately address
- 4 cultural resources and tribal sacred sites through the development review process.
- 5 ○ **Policy CO-4.13:** Avoid or mitigate to the maximum extent feasible the impacts of
- 6 development on Native American archaeological and cultural resources.
- 7 ○ **Policy CO-4.14:** Within the Delta Primary Zone, ensure compatibility of permitted land use
- 8 activities with applicable cultural resources policies of the Land Use and Resource
- 9 Management Plan of the Delta Protection Commission.

10 18.3 Environmental Consequences

11 This section describes the methods used to identify the known resources that would be affected by
 12 the action alternatives as well as BDCP effects on previously unidentified resources. The direct,
 13 indirect, and cumulative effects on known and unknown archeological, built environment, and TCP
 14 resources that would result from implementing BDCP alternatives are evaluated and mitigation
 15 measures are presented to reduce potential effects.

16 18.3.1 Determination of Effects

17 This section describes the criteria used to identify adverse effects on cultural resources. “Adverse effect”
 18 here means effects that are significant under CEQA and other the relevant state regulatory frameworks
 19 and thresholds, and are “adverse” within the meaning of NEPA and the Section 106 regulations.

20 Effects on unique archaeological resources and historical resources are considered adverse for
 21 purposes of NEPA, and significant for purposes of CEQA, if the BDCP would do any of the following.

- 22 ● Demolish or materially alter the qualities that justify the resource for inclusion or eligibility for
 23 inclusion on the CRHR (State CEQA Guidelines Section 15064.5[b][2][A],[C]). For the purposes of
 24 this analysis, “materially altering or destroying qualities that contribute to eligibility” means
 25 altering the resource so that it can no longer convey its association with significant historical
 26 events or people, distinctive style or artistic value, or the potential to yield information
 27 important in history or prehistory (14 CCR Section 4852[b]).
- 28 ● Demolish or materially alter the qualities that justify the inclusion of the resource on a local
 29 register (State CEQA Guidelines Section 15064.5[b][2][B]) or its identification as an historical
 30 resource survey meeting the requirements of California PRC Section 5024.1(g). For the purposes
 31 of this analysis, “materially altering a resource so that it no longer qualifies for a local register”
 32 means altering the resource so it can no longer convey the significance that makes it eligible for
 33 the local register. These significance themes often mirror the CRHR and the NRHP, but
 34 emphasize historical or cultural themes that are locally relevant.
- 35 ● Demolish or materially impair the characteristics that allow a site to qualify as a unique
 36 archaeological resource (California PRC Section 21083.2[g]). “Demolishing or materially
 37 impairing a unique archaeological resource” means altering the ability of the site to convey one
 38 or more of the following characteristics.

- 1 ○ Data useful in important scientific questions associated with demonstrable public interest in
- 2 those questions.
- 3 ○ The quality of being the oldest or best example of a type.
- 4 ○ Association with an important person or event in history or prehistory (California PRC
- 5 Section 21083.2[g]).
- 6 ● The criteria of adverse effect in 36 CFR Part 800.5(a)(1) provides a standard for Section 106 of
- 7 the NHPA. Alter, directly or indirectly, any of the characteristics of a historic property that
- 8 qualify the property for inclusion in the National Register in a manner that would diminish the
- 9 integrity of the property's location, design, setting, materials, workmanship, feeling, or
- 10 association (36 CFR 800.5[a][1]). For the purposes of this analysis, "alteration of qualifying
- 11 characteristics" may include but is not necessarily limited to:
 - 12 ○ Physical destruction of all or part of a property.
 - 13 ○ Alteration of built-environment resources that is not consistent with the federal standards
 - 14 for treatment of historic properties (36 CFR 68).
 - 15 ○ Removal of a property from its historical location.
 - 16 ○ Alteration of the significant features of a property or introduction of incongruous elements
 - 17 to the setting.
 - 18 ○ For federally owned properties, transfer of the property out of federal control without
 - 19 adequate and legally enforceable mechanisms to ensure preservation.
 - 20 ○ Neglect of a property that results in deterioration (36 CFR 800.5[a][2]).
- 21 ● Disturbance of human remains, including remains interred outside of established cemeteries is
- 22 an adverse effect (State CEQA Guidelines, Appendix G checklist). For the purposes of this
- 23 analysis, "disturbance" may consist of direct excavation or damage through compaction even
- 24 where the resource is not directly excavated.

25 **18.3.2 Direct and Indirect Effects and Impact Mechanisms**

26 BDCP-related activities may affect cultural resources directly or indirectly. This section describes
 27 the direct and indirect impact mechanisms associated with the BDCP alternatives. Direct effects on
 28 cultural resources may occur through any of the following.

- 29 ● Ground-disturbing construction that damages historic or prehistoric archaeological sites and
- 30 impairs the constituent deposits in the site and their utility for answering archaeological
- 31 research questions.
- 32 ● Ground-disturbing construction that unearths and damages human remains.
- 33 ● Direct demolition of built-environment resources such as historic-era residences, structures or
- 34 buildings, or landscape features.
- 35 ● Direct excavation or alteration of TCPs.
- 36 ● Direct effects on individual resources creating adverse effects on rural historic landscapes,
- 37 where the individual resource is a constituent element of the rural historic landscape.

38 Indirect effects may occur under any of the circumstances described below.

- 1 • Construction in the vicinity of a resource removes features of the surrounding setting, where the
2 setting is an integral part of the resource.
- 3 • Construction in the vicinity introduces new physical features that are incongruent with the
4 setting, where the setting is an integral part of the resource.
- 5 • Introduction of new sources of sound or activities in the vicinity that would be inconsistent with
6 the setting, where the setting is an integral part of the resource.

7 The BDCP alternatives would result in direct and indirect effects, as described below. Where
8 resources have been recorded in the footprint of action alternatives, these resources are identified
9 in the relevant impact discussions.

10 **18.3.3 Geographic Scope of Effects**

11 The BDCP covers a large, generally rural area. The boundaries of the area in which significant effects
12 could occur for each alternative were determined by taking this kind of environment into
13 consideration, as well as the nature of CM1, such as temporary impacts, temporary and permanent
14 power access, and indirect or visual impacts. The approach was as follows:

- 15 • For direct impacts: all land physically within the footprint of alternative water conveyance
16 alignments is included, for both temporary impacts and permanent impacts. Usually the entire
17 legal parcel is included, whether or not it is all within the area of direct impacts. In areas where
18 the parcels are very large, generally agricultural, the boundary of the survey map may not
19 include the entire parcel, but includes a reasonable portion, determined by land use. The edge of
20 the survey may be established following features such as roads, irrigation channels, changes in
21 crops, or natural topographic features.
- 22 • For the tunnel areas: all land directly above the tunnel was included, again generally including
23 the entire legal parcel. It was decided that it would be prudent in some areas to include
24 properties adjacent to the tunnel footprint if they contain built resources in close proximity to
25 the tunnel footprint to demonstrate that effects potentially resulting from settlement or
26 vibration are considered.
- 27 • For temporary and permanent power: only the footprint of the power line is included in the survey
28 map. In cases where a built resource is very close to this footprint, that resource is included in the
29 survey.
- 30 • For visual or auditory impacts: built resources facing on-bank intake facilities or pumping
31 plants, but are across the river, are included. Resources adjacent to these plants are also
32 included for these potential indirect effects where the height or line of sight to the structure
33 creates an effect.
- 34 • For impacts to National Register listed districts or potential districts: the district in its entirety is
35 included, because an effect to one element of the district has the potential to diminish the
36 integrity of the entire district.

37 **18.3.4 Issues Not Carried Forward for Detailed Analysis**

38 Potential effects on cultural resources at upstream reservoirs associated with operational changes
39 are not carried forward for detailed analysis because they are too speculative for meaningful
40 consideration. Currently, reservoir levels upstream of the Delta fluctuate greatly between wet and

1 dry years, and during operational changes necessary to meet flood management and water use
 2 demands. Each action alternative is associated with particular operational changes for upstream
 3 reservoirs, or “scenarios” (see Chapter 3, *Description of Alternatives*). These operational changes,
 4 combined with other regional effects such as climate change, may (but are not certain to) increase
 5 both the range of variation in water levels at these reservoirs and the frequency that reservoir levels
 6 are drawn down. Current modeling shows that precipitation, rather than operational rules, is the
 7 largest cause of fluctuation at upstream reservoirs. Because precipitation patterns may be altered by
 8 climate change, a slight increase in the frequency with which cultural resources at upstream
 9 reservoirs are exposed rather than inundated may occur. However, because the increase in degree
 10 and frequency fluctuation is likely to be small and is speculative as to degree and intensity, this
 11 effect cannot be carried forward for meaningful analysis for the majority of the action alternatives.
 12 Of the action alternatives, Alternative 4 however, has some potential to increase fluctuation of
 13 reservoir levels at Lake Oroville. Because all cultural resources within the area affected by water
 14 storage at Lake Oroville are currently managed pursuant to applicable state and federal law, the
 15 BDCP is not expected to meaningfully contribute to new effects requiring additional management
 16 policies at this storage facility. Furthermore, climate change, by itself, is not an effect of the action
 17 alternatives.

18 **18.3.5 Effects and Mitigation Approaches**

19 **18.3.5.1 No Action Alternative**

20 Under the No Action Alternative, current and reasonably foreseeable projects would continue, with
 21 the associated potential for effects on cultural resources. These projects and programs include the
 22 continued implementation of SWP/CVP operations, maintenance, enforcement, and protection
 23 programs by federal, state, and local agencies and nonprofit groups, as well as projects that are
 24 permitted or under construction. A complete list of the programs and plans considered under the No
 25 Action Alternative is provided in Appendix 3D, *Defining Existing Conditions, the No Action/No Project*
 26 *Alternative, and Cumulative Impact Conditions*. The following discussion describes the effects on
 27 cultural resources that would occur if no new conveyance facilities were constructed; these effects
 28 would not be the result of the BDCP, but instead the result of reasonably foreseeable projects and
 29 actions that would occur without the BDCP as of the year 2060.

30 **The Future of Cultural Resources in the Delta**

31 The Delta region is rich in prehistoric and historic-era cultural resources. These resources include
 32 prehistoric and historic archaeological sites, buried human remains, and built-environment
 33 resources. Subsidence, levee failure, and climate change all have the potential to increase the
 34 inundation and erosion of cultural resources that currently occur on the landside of existing flood
 35 management structures.

36 **SWP/CVP Operations**

37 Ongoing SWP/CVP operations include both levee repair and habitat restoration and conservation
 38 activities. Where specific projects will result in ground-disturbing construction these actions have
 39 the potential to result in effects on cultural resources through direct excavation into such resources
 40 or the introduction of new inconsistent features such as setback levees, borrow areas, or other
 41 landside features that may not be consistent with the rural agricultural setting.

1 Ongoing Plans, Policies, and Programs

2 The plans, policies, and projects that are included in the No Action Alternative are summarized in
 3 Table 18-1 as well as in Appendix 3D, *Defining Existing Conditions, the No Action/No Project*
 4 *Alternative, and Cumulative Impact Conditions.*

5 **Table 18-1. Programs and Projects Occurring under the No Action Alternative**

Agency	Program/ Project	Status	Description of Program/Project	Potential Effects on Cultural Resources
California Department of Water Resources	Levee Repair- Levee Evaluation Program	Ongoing	Identification and repair of hundreds of levees throughout the Central Valley. These repairs are necessary to maintain the functionality of flood management systems that have deteriorated over time and/or do not meet current design standards.	Individual future levee repair projects may disturb landside and waterside cultural resources such as prehistoric and historic archaeological sites, and result in direct and indirect effects on built-environment resources.
U.S. Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Water Resources and California Department of Fish and Wildlife	San Joaquin River Restoration Program	Ongoing	The program would implement a comprehensive long-term effort to restore flows to the San Joaquin River from Friant Dam to the confluence of Merced River and restore a self-sustaining Chinook salmon fishery in the river. There are many physical improvements within and near the San Joaquin River that will be undertaken to fully achieve the river restoration goal.	Individual projects necessary to implement this program may result in disturbance to cultural resources such as prehistoric and historic archaeological sites, and result in direct and indirect effects on built-environment resources.
California Department of Water Resources	Delta Levees Flood Protection Program	Ongoing	Under this program DWR works with the local agencies to maintain, plan, and complete levee rehabilitation projects.	Individual projects necessary to implement this program may result in disturbance to cultural resources such as prehistoric and historic archaeological sites, and result in direct and indirect effects on built-environment resources.
Yolo County	Yolo County General Plan Update/Plan Buildout	Ongoing	The Yolo County 2030 General Plan was adopted in November of 2009. The updated plan would allow for additional growth in the unincorporated area of the County of approximately 30,195 people, up to 10,784 homes, and 19,209 jobs.	Buildout will result in significant effects on archaeological and built-environment resources.
Semitropic Water Storage District	Delta Wetlands Project	EIR/EIS completed 2011	Wildlife enhancement on Delta islands.	The project may demolish cultural resources or expedite decay of cultural resources.
NMFS/USFWS	2008 and 2009 Biological Opinions	Ongoing.	The Biological Opinions issued by NMFS and USFWS establish certain RPAs to be implemented requiring habitat restoration	Construction of habitat may demolish cultural resources or expedite decay of cultural resources.

6

1 The plans, programs, and projects that would occur under the No Action Alternative collectively will
2 result in adverse effects on cultural resources. For example, Yolo County concludes in the General
3 Plan Update EIR that plan buildout will result in significant and unavoidable effects on cultural
4 resources (County of Yolo 2009b:546). Similarly, levee repairs performed in the Delta region under
5 the No Action conditions are likely to contribute to effects on archaeological and built-environment
6 resources and buried human remains because the Delta is sensitive for such resources, and
7 construction of such improvements would require ground-disturbing work. Habitat restoration in
8 Suisun Marsh or elsewhere necessary to comply with federal biological opinions could also
9 contribute to effects on archaeological and built-environment resources and buried human remains.

10 Although mitigation may be implemented as a part of these ongoing projects, which would reduce
11 their effects, or manage significant effects through treatment, such treatment typically does not
12 reduce impacts on cultural resources to less than adverse. Mitigation such as data recovery
13 excavations conducted to retrieve scientifically important material from archaeological sites reduces
14 the loss of data, but does not completely avoid data loss because complete recovery of data is
15 typically infeasible. In addition, treatment of identified effects and construction monitoring cannot
16 guarantee that effects on undiscovered archaeological resources and buried human remains would
17 be avoided, because unidentified resources can occur without surface manifestation that would
18 allow their identification and avoidance. In a similar fashion the set of actions that would occur
19 under the No Action Alternative would likely result in the demolition of significant historical
20 structures. Although mitigation is typically performed to document such structures before they are
21 lost, such documentation does not replace the structure and does not reduce such impacts to a level
22 less than significant. For these reasons, the loss of built environment cultural resources under the
23 No Action Alternative would be adverse. No mitigation is proposed under this impact because the
24 BDCP would not be implemented and no mitigation would be prepared for the action alternatives.
25 Collectively, effects on cultural resources under the No Action Alternative would therefore be
26 adverse.

27 **Catastrophic Seismic Risks**

28 The Delta and vicinity is within a highly active seismic area, with a generally high potential for major
29 future earthquake events along nearby and/or regional faults, and with the probability for such
30 events increasing over time. Based on the location, extent and non-engineered nature of many
31 existing levee structures in the Delta area, the potential for significant damage to, or failure of, these
32 structures during a major local seismic event is generally moderate to high. In the instance of a large
33 seismic event, levees constructed on liquefiable foundations are expected to experience large
34 deformations (in excess of 10 feet) under a moderate to large earthquake in the region (see
35 *Appendix 3E, Potential Seismic and Climate Change Risks to SWP/CVP Water Supplies* for more
36 detailed discussion). Reclaiming land or rebuilding levees after a catastrophic event due to climate
37 change or a seismic event could result in the destruction of cultural resources.

38 **CEQA Conclusion:** Under the No Action conditions significant effects on archaeological and built-
39 environment resources as well as human remains would occur. Although it is expected that project-
40 level review for individual actions would result in mitigation of these impacts, such mitigation
41 would reduce but not necessarily avoid such effects. Data recovery excavations and construction
42 phase monitoring do not avoid the loss of data in archaeological sites or the potential for
43 inadvertent damage to buried resources and human remains that cannot be identified in advance of
44 construction. Similarly, treatment for built-environment resources would reduce the severity of

1 effects, but would not mitigate the anticipated loss of significant structures to a level less than
2 significant. For these reasons effects on cultural resources would be significant and unavoidable.

3 **18.3.5.2 Alternative 1A—Dual Conveyance with Pipeline/Tunnel and Intakes** 4 **1–5 (15,000 cfs; Operational Scenario A)**

5 A total of five intakes would be constructed on the east bank of the Sacramento River under
6 Alternative 1A. For the purposes of this analysis, Alternative 1A was assumed to entail construction
7 of Intakes 1–5. This alternative would also include an intermediate forebay, and the conveyance
8 facility would be a buried pipeline/tunnel (see Figures 3-2 and 3-3 in Chapter 3, *Description of the*
9 *Alternatives*).

10 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of** 11 **Conveyance Facilities**

12 **Identified Resources**

13 Record searches at the CHRIS and inventory efforts for the BDCP have identified seven previously
14 recorded prehistoric archaeological sites in the footprint of this alternative (Appendix 18B, Table
15 18B-1). These seven previously recorded resources represent the known resources that occur in the
16 footprint of this alternative. Detailed site descriptions are provided in Appendix 18B, Section B.1.2
17 *Archaeological Site Descriptions*.

18 **Significance of Identified Archaeological Resources**

19 Many of the directly affected sites are midden sites, with debris and artifacts associated with
20 prehistoric habitation and residence activities. Midden sites in the Plan Area are often colloquially
21 referred to as “mound sites” because they often form low mounds elevated relative to the
22 surrounding landform. While the original raised deposit has sometimes been destroyed, midden
23 sites often have substantial deposits below the original raised landform that remain intact that
24 typically contain the material remains associated with prehistoric habitation. This organic debris
25 can be used for radiocarbon dating, as well as material that reveals the nature of subsistence
26 activities pursued by prehistoric populations. Because there is no single unified prehistoric
27 chronology for the Delta region, substantial research questions remain unresolved regarding nature
28 and changes of subsistence and settlement activity over the span of the prehistoric occupation of the
29 Delta. The Delta is the prehistoric point of articulation between Central Valley cultures and the
30 aboriginal people that occupied the San Francisco Bay area. Because the cultural chronology and
31 sources of cultural change for the Delta remain unresolved in part, sites in the footprint of this
32 alternative likely contain information that could help clarify these research issues. For these reasons
33 these resources are likely significant under the fourth criterion for the CRHR and NRHP (see Section
34 18.2.1.2, “That have yielded, or may be likely to yield, information important in prehistory or
35 history”).

36 Three of the identified sites contain human burials, as described on the site records (CA-SAC-328,
37 CA-SAC-59, and CA-SAC-65/H). Most if not all of the remaining sites are likely to contain additional
38 burials because midden sites in the Plan Area typically contain human burials or cremations. Burial
39 components within these sites often contain ornaments and other personal items such as
40 charmstones, beads, and other decorative material. Because the style and form of these artifacts
41 change throughout prehistory, and because these stylistic changes have been defined, these

1 materials provide a method of associating archaeological material with specific prehistoric time
2 periods. The ability to associate habitation remains with specific time periods is one of the most
3 significant problems in prehistoric research, because the sequence of specific adaptations and
4 behaviors only becomes clear when a chronology can be constructed that associates behavior and
5 material culture with specific time frames. For this reason these resources are likely significant
6 under the fourth criterion for the CRHR and NRHP.

7 Because many of these resources are large (typically in excess of 30 meters across), they are each
8 likely to contain some portion of the deposit with sufficient integrity to yield artifacts in their
9 original associations in a manner that will convey these significance themes. Therefore these
10 identified resources are likely to qualify as historical resources under CEQA. For the same reasons,
11 these resources are likely to be eligible for the NRHP.

12 **Anticipated Effects on Identified Resources**

13 The exact location of these resources cannot be disclosed because such disclosure might lead to
14 damage of the sites. However, these resources occur within the footprint of both temporary work
15 areas and permanent surface impacts. The resources are generally distributed evenly across the
16 alignment, but are somewhat clustered where construction of large above-ground features would
17 occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern
18 end of the alignment. Ground-disturbing construction is likely to disturb the deposits and thus
19 materially alter their ability to convey their significance. Much of the data potential in archaeological
20 resources exists in the spatial associations of different artifacts and other cultural material. Where
21 artifacts that have known associations with particular time periods occur adjacent to other material
22 such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows
23 an inference as to the age of the subsistence remains, thereby allowing researchers to infer
24 particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing
25 construction, vibration, and other physical disturbance may disrupt these associations and thus
26 disrupt the qualities for which the sites may qualify as historical resources or historic properties. In
27 addition, because not all identified resources are legally accessible, these resources may be
28 significant for other reasons than their data potential. Indirect effects such as introduction of
29 changes to the setting associated with construction of new features or creation of new sources of
30 noise (also a change to the setting) may diminish the basis for the significance of these resources.
31 For these reasons, construction has the potential to materially impair these resources under CEQA
32 and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be
33 adverse.

34 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
35 damage these resources. This damage may impair the integrity of these resources and thus reduce
36 their ability to convey their significance. For these reasons this effect would be adverse.

37 **CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological
38 resources that occur in the footprint of this alternative. DWR identified these resources and finds
39 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
40 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
41 potential to qualify as historical resources. Therefore, these sites are considered historic resources
42 for the purposes of CEQA. This impact would be significant because construction could materially
43 alter or destroy the potential of these resources to yield information useful in archaeological
44 research, the basis for the significance of these resources, through excavation and disruption of the

1 spatial associations that contain meaningful information. Identified but currently inaccessible
 2 resources may also be significant under other register criteria; indirect effects such as introduction
 3 of new inconsistent changes to the setting may also diminish the significance of these resources.
 4 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
 5 scientifically important material would be retrieved because feasible archaeological excavation only
 6 typically retrieves a sample of the deposit, and portions of the site with important information may
 7 remain after treatment. Construction could damage these remaining portions of the deposit.
 8 Therefore, this impact is significant and unavoidable.

9 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
 10 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
 11 **Archaeological Sites**

12 Prior to ground-disturbing construction, the BDCP proponents will implement a treatment plan
 13 for identified “historic properties,” “historical resources” and “unique archaeological resources”
 14 sites affected by Alternative 1A construction, that cannot be avoided.

15 ***Basis for Selection of Treatment***

16 Identified archaeological resources occur in the footprint of large features that would be
 17 constructed under this alternative. Preservation in place, through methods such as redesign of
 18 relevant facilities to avoid destruction or damage to eligible cultural resources, capping
 19 resources with fill, or deeding resources into conservation easements shall be the preferred
 20 method of mitigation where feasible. Because these resources occur within the footprint of these
 21 features, avoidance may not be feasible in light of costs, logistics, technological and
 22 environmental considerations, the location of the archeological resources, and the extent to
 23 which avoidance and/or preservation of the resource is inconsistent with the objectives of the
 24 project. These objectives include protection of other sensitive environmental resources where
 25 possible. Because of the density and location of other sensitive environmental resources such as
 26 natural communities and habitats, relocation of proposed facilities necessary to ensure all
 27 historical resources are preserved in places is unlikely to be feasible. Furthermore, the large,
 28 linear, nature of proposed conveyance facilities would result in overlap with cultural resources
 29 across almost any potential alignment because of the manner in which cultural resources are
 30 distributed in the study area. These same facilities will require ongoing maintenance and
 31 operational activities that would likely be inconsistent with dedicated conservation easements
 32 or other land management methods designed to preserve existing resources in place. For these
 33 reasons, preservation of all potentially affected archaeological sites through capping with soil or
 34 incorporation into conservation easements or green space is not likely to be feasible.
 35 Accordingly, data recovery is necessary to retrieve information that conveys the significance of
 36 the resource that would otherwise be lost This data recovery excavation will conform to the
 37 following standards that meet the Secretary of the Department of the Interior’s professional
 38 qualification standards provided in 36 CFR 68:

- 39 • The BDCP proponents will retain a qualified archaeological consultant to conduct data
 40 recovery excavations necessary to retrieve material that would otherwise be lost, (material
 41 with scientifically important data associated with the significance of the resource). Qualified
 42 archaeological consultant here means a consultant with a graduate degree in archaeology,
 43 anthropology, or closely related field, plus at least one year full-time professional experience
 44 or equivalent specialized training in archaeological research, administration or

1 management, at least four months of supervised field and analytic experience in general
2 North American archaeology, and has demonstrated experience conducting and completing
3 effective data recovery excavations at the kinds of sites subject to treatment.

- 4 ● BDCP proponents will prepare, and deposit with the relevant information center of the
5 CHRIS, a data recovery plan prior to conducting these excavations, as required under State
6 CEQA Guidelines Section 15126.4(b)(3)(C). The plan will provide a literature review of
7 recent regional archaeological research and a summary of regional research questions. The
8 plan will incorporate the methods prescribed above and include a more detailed description
9 of the sampling and excavation methods that are appropriate for the regional research
10 questions. The plan will not disclose the location of the resources subject to treatment in a
11 manner that would allow their location to be known by the public so as to avoid inadvertent
12 or intentional damage to or removal of the resources by members of the public.
- 13 ● Data recovery excavations will remove a sample of the affected portion of the deposit to
14 retrieve scientifically important material. Excavation will be conducted in representative
15 levels, and material removed will be divided and screened through a combination of 1/4"
16 and 1/8 " mesh screen, so as to capture both the gross cultural constituents and the finer
17 material that can only be captured in fine mesh. Excavation will be conducted in 10-
18 centimeter levels so that the horizontal association of different cultural materials is
19 recorded. Removed material will be segregated by type and bagged with labels noting their
20 horizontal and vertical location relative to an established datum point. The datum point will
21 be recorded in the field with GPS to at least 10-centimeter horizontal and vertical accuracy.
22 If, in the course of data recovery excavations, it is determined that, contrary to available
23 evidence, the resource lacks integrity, data recovery excavations will cease.
- 24 ● Faunal material (animal bone) will be segregated and studied by a qualified faunal analyst to
25 identify the species pursued, relative abundance and diversity of different species present,
26 and the manner in which the prey were processed by the prehistoric occupants.
- 27 ● Obsidian glass will be retrieved and studied through both X-ray fluorescence (a method that
28 allows the source of the obsidian to be identified) and obsidian hydration analysis (a
29 method that allows approximate determination of the time when the material was subject to
30 human modification).
- 31 ● Soil samples will be retrieved, with their horizontal and vertical location recorded, for
32 flotation analysis (a method of separating light organic material such as fine plant remains
33 from the deposit, in order to identify plant species pursued by prehistoric populations).
- 34 ● Because some of the resources subject to treatment contain human remains, provisions for
35 such remains are necessary. If human remains are discovered in these deposits during data
36 recovery, the county coroner will be contacted as required in California Health and Safety
37 Code Section 7050.5. After the coroner confirms the remains are of prehistoric origin, the
38 NAHC will be contacted and given the opportunity to identify a most likely descendant
39 (MLD). The MLD will be given the opportunity to reinter the remains with appropriate
40 dignity. If the NAHC fails to identify the MLD or if the parties cannot reach agreement as to
41 how to reinter the remains as described in California PRC Section 5097.98(e), the
42 landowner will reinter the remains at a location not subject to further disturbance. The
43 BDCP proponents will ensure the protections prescribed in California PRC Section
44 5097.98(e), are performed, such as the use of conservation easements and recording of the

1 location with whichever county in which the remains are found as well as the relevant
2 information center of the CHRIS.

- 3 • After completion of data recovery excavations DWR and/or the appropriate federal agencies
4 will prepare a data recovery report. DWR and/or the appropriate federal agencies will
5 retain a qualified archaeological consultant to conduct relevant studies specified in the data
6 recovery plan such as obsidian hydration, faunal analysis, and X-ray fluorescence. The
7 consultant or staff archaeologists will synthesize the results of these studies and summarize
8 the results relative to regional research questions in the data recovery report. The report
9 will be filed with the relevant information center of the CHRIS. DWR and/or the appropriate
10 federal agencies will also store the recovered material (other than human remains) at an
11 appropriate facility for curation.
- 12 • **Construction phase monitoring and resource protection:** During construction on or near
13 the resource, DWR and/or the appropriate federal agencies will retain a qualified
14 archaeologist (a person knowledgeable in the identification of the kind of resources known
15 to occur), to observe excavations over any remaining portions of the deposit that are
16 sensitive for buried human remains or which may contain other significant buried
17 archaeological material that could be inadvertently damaged. If human remains are
18 discovered the archaeologist will direct compliance with the requirements of California
19 Health and Safety Code Section 7050.5 and California PRC Section 5097.98 and the relevant
20 federal agency with responsibility for Section 106 will be contacted. In addition DWR
21 and/or the appropriate federal agencies will use fencing, flagging, or other appropriate
22 means to exclude unnecessary disturbance and activity from sensitive resources during
23 construction.

24 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
25 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
26 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
27 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
28 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
29 into account through the implementation of this programmatic agreement.

30 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory** 31 **Efforts**

32 An inventory for the majority of the footprint for this alternative has not been conducted because
33 the majority of the footprint is not currently legally accessible (Appendix 4A, *Summary of Survey*
34 *Data Collection by Department of Water Resources to Obtain Information Regarding Baseline*
35 *Conditions in Areas That Could Be Affected by BDCP*). Furthermore, complete evaluation of all
36 potentially affected resources associated with this alternative may require destructive test
37 excavation in advance of any final decision regarding the selection of the alternative. Because
38 several prehistoric archaeological sites qualifying as historical resources have been identified in the
39 footprint of this alternative, the remaining non-accessible portion of the footprint for this
40 conveyance feature is sensitive for previously unidentified archaeological resources. Record
41 searches performed through the CHRIS reviewed the mapped location of previous cultural resource
42 inventories in the footprint of this alternative and the vicinity. This map review revealed that a
43 cultural resources inventory has never been conducted in the majority of the footprint for this
44 alternative. The presence of archaeological sites that qualify as historical resources and historic

1 properties in the portion of the footprint that has been previously inspected provides a sample of
2 the likely density and occurrence of resources in the remaining footprint. For this reason, additional
3 prehistoric archaeological resources are likely to be found in the portion of the footprint where
4 surveys have not been conducted, once access is available and such studies can be completed.

5 In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era
6 archaeological resources. It is likely that previously unidentified historic archaeological sites occur
7 in the footprint of this alternative because of the intensity of human activity in the Plan Area during
8 the historic era, as described in Section 18.1.6, *Historic-Era Setting*.

9 Prehistoric sites in the Plan Area tend to be large and rich in material remains, including human
10 burials and associated ornaments and beads. Habitation debris also often contains both floral and
11 faunal material that can be used for both radiocarbon dating and analysis regarding subsistence
12 strategies. In addition, the large scale of typical prehistoric archaeological resources suggests
13 portions of these deposits will remain with sufficient integrity to convey research information.
14 Therefore, these sites are likely to qualify as historical resources or unique archaeological resources
15 under CEQA and be eligible for the NHPA.

16 Historic sites are likely to be associated with the historic-era themes of settlement, reclamation,
17 agriculture, and flood management in the Delta region. Because the reclamation and agricultural
18 development of the Delta region provided part of the economic base for the development of
19 surrounding urban centers, these historic themes are significant at both a state and national level.
20 These resources accordingly may contain data useful in historical research. In addition, the intensity
21 of historic activity in the Delta region suggests that many of these resources are likely to be
22 distributed across the footprint of this alternative and some are likely to retain sufficient integrity to
23 convey this significance if they are subject to archaeological excavation and investigation. Therefore,
24 these sites are likely to qualify as historical resources or unique archaeological resources under
25 CEQA and be eligible for the NHPA.

26 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
27 resources by disrupting the spatial associations that convey data useful in research or changing the
28 setting such that the resource no longer contains its significance. These impacts would thus
29 materially impair these resources within the meaning of CEQA and adversely affect the resources
30 within the meaning of Section 106 of the NHPA. The locations of various features such as intakes,
31 forebays, and tunnels shaft locations that would result in ground disturbance are depicted in Figure
32 M3-1 in the mapbook volume. These effects would be adverse.

33 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
34 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
35 their integrity. For these reasons this effect would be adverse.

36 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
37 archaeological resources that cannot be identified at this time because much of the footprint is not
38 legally accessible. Because many of these resources are likely to have data useful in prehistoric and
39 historic archaeological research, as well as the integrity to convey this significance, they are likely to
40 qualify as historical resources or unique archaeological sites under CEQA and be eligible for the
41 NHPA. Ground-disturbing construction may materially alter the significance of these resources by
42 disrupting the spatial associations that could yield important data, resulting in a significant effect.
43 While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot guarantee that all
44 eligible or significant resources would be preserved in place, or that all important data would be

1 retrieved before construction destroys these resources. The scale of the BDCP, investment into
 2 existing designs, and the presence of other important environmental resources such as habitat,
 3 natural communities, and wetlands that should be avoided are constraints on the flexibility and
 4 feasibility of avoidance. For these reasons this impact is significant and unavoidable.

5 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of**
 6 **Archaeological Resources**

7 Prior to ground-disturbing construction, the BDCP proponents will implement the following
 8 mitigation measures:

- 9 ● Because DWR and federal agencies could not feasibly access the majority of the footprint for
 10 this alternative, a cultural resource inventory has not been completed for the entire
 11 footprint. Prior to ground-disturbing construction, the BDCP proponents will ensure that an
 12 inventory and evaluation report for cultural resources is completed. The inventory will
 13 cover the APE for relevant federal undertakings.
- 14 ● The scope of the inventory will include the entire area where effects may occur. Such effects
 15 consist of direct disturbance through excavation or indirect damage through vibration or
 16 changes to the setting, where the setting may be relevant for archaeological resources.
- 17 ● The work will be led or supervised by cultural resource specialists who meet the Secretary
 18 of the Department of the Interior's professional qualification standards provided in 36 CFR
 19 61.
- 20 ● Inventory methods will include pedestrian surveys and other any other appropriate
 21 sampling methods identified by DWR and/or the federal lead agencies.
- 22 ● Identified resources will be mapped and described on forms provided by the California State
 23 Parks forms ("DPR" forms). Mapping will be performed by recording data points with GPS
 24 hardware that can be imported and managed digitally.
- 25 ● For all identified resources DWR and/or the appropriate federal agencies will evaluate the
 26 resources to determine if they are any of the following.
 - 27 ○ Historical resources (State CEQA Guidelines Section 15064.5[a])
 - 28 ○ Unique archaeological resources under CEQA (California PRC Section 21083.2[g])
 - 29 ○ Historic properties (36 CFR 60.4)
 - 30 ○ Eligible for local registers
- 31 ● The recorded resources and the resource evaluations will be summarized in an inventory
 32 report. In the inventory report DWR and/or the appropriate federal agencies will also
 33 determine if individual resources qualifying as unique archaeological sites, historical
 34 resources, or historic properties will require mitigation to the extent feasible, as described
 35 below. The BDCP proponents will make such a determination if the BDCP would involve any
 36 of the following consequences.
 - 37 ○ Demolish or materially alter the qualities that make the resource eligible for listing in
 38 the CRHR (State CEQA Guidelines Section 15064.5[b][2][A],[C]).
 - 39 ○ Demolish or materially alter the qualities that justify the inclusion of the resource on a
 40 local register or its identification in an historical resources survey meeting the

- 1 requirements of California PRC Section 5024.1(g), unless the BDCP proponents
2 establishes by a preponderance of evidence that the resource is not historically or
3 culturally significant (State CEQA Guidelines Section 15064.5[b][2][B]).
- 4 ○ Alter, directly or indirectly, the qualities that make a resource eligible for listing in the
5 NRHP (36 CFR 800.5[a][1]).
 - 6 ○ Demolish or materially impair the qualities that allow a resource to qualify as a unique
7 archaeological site (California PRC Section 21083.2).
 - 8 ● For all resources qualifying as unique archaeological resources, historical resources, or
9 historic properties that would be subject to significant effects, the BDCP proponents will
10 develop and implement treatment. Such treatment will consist of the following, in order of
11 priority.
 - 12 ○ It should be noted that this order of priority applies to mitigation on historical resources
13 performed to satisfy CEQA. Relevant federal agencies with management responsibilities
14 for cultural resources shall implement mitigation for adverse effects to satisfy Section
15 106 of the NHPA, which does not specify this order of priority.
 - 16 ○ Preservation in place where feasible in light of costs, logistics, technological, and
17 environmental considerations, and the extent to which avoidance is consistent with the
18 objectives of the project, through methods such as redesign of relevant facilities to avoid
19 destruction or damage to eligible cultural resources, capping resources with fill, or
20 deeding resources into conservation easements.
 - 21 ○ Review and study of existing collections previously retrieved from affected resources,
22 where feasible, in lieu of data recovery excavations.
 - 23 ○ Data recovery excavations that retrieve the information that makes the resource eligible
24 for CRHR or NRHP listing, or that qualifies the site as a unique archaeological resource.
25 If data recovery through excavation is the only feasible mitigation, a data recovery plan,
26 which makes provisions for adequately recovering the scientifically consequential
27 information from and about the historical resource, will be prepared and adopted prior
28 to any excavation being undertaken. Such studies will be deposited with the relevant
29 information center of the CHRIS. Excavation as mitigation will be restricted to those
30 parts of the resource that would be damaged or destroyed by the BDCP. If, in the course
31 of data recovery excavations, it is determined that contrary to available evidence, the
32 resource lacks integrity, data recovery excavations will cease. The data recovery plan
33 will specify the basis for the significance of the resource and methods for retrieving the
34 consequential information from the site. After completion of excavation the BDCP
35 proponents will retain a qualified archaeological consultant to synthesize the findings
36 into a data recovery report describing the findings and will deposit the report at the
37 relevant information center of the CHRIS.
 - 38 ● The treatment plan will identify treatment methods that are proposed by the Lead Agencies
39 and other public entities. The plan will also specify the basis for selecting a particular
40 mitigation measure.
 - 41 ● For archaeological sites that qualify as historical resources, the BDCP proponents will
42 consider preservation in place (including by avoidance) as the preferred treatment where

1 feasible in light of costs, logistics, technological, and environmental considerations and the
2 extent to which avoidance is consistent with the objectives of the project.

- 3 • If preservation in place of archaeological sites that qualify as historical resources or unique
4 archaeological resources is not feasible in light of costs, logistics, technological
5 considerations, the location of the find, and the extent to which preservation of the find is
6 consistent or inconsistent with the design and objectives of the BDCP, the BDCP proponents
7 will include a discussion in the treatment plan describing why the selected mitigation serves
8 the interests protected by CEQA better than preservation in place.
- 9 • **Construction phase monitoring:** During construction on or near resources sensitive for
10 human remains, the BDCP proponents will retain a qualified archaeologist to observe
11 excavations over any remaining portions of the deposit that are sensitive for buried human
12 remains. If human remains are discovered the archaeologist will direct compliance with the
13 requirements of California Health and Safety Code Section 7050.5 and California PRC Section
14 5097.98 and the relevant federal agency with responsibility for Section 106 will be
15 contacted. If Native American human remains are discovered on federal land, work in the
16 immediate vicinity will cease, and the BDCP proponents will contact the relevant
17 representative of the federal agency where the remains were discovered, as prescribed in 25
18 USC Section 3002(d) (NAGPRA). After notification from the relevant agency representative
19 and treatment of the remains as required under NAGPRA, work may continue. Disposition of
20 the remains will follow the ownership priority described in NAGPRA (25 USC Section
21 3002[a]).

22 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
23 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
24 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
25 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
26 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
27 into account through the implementation of this programmatic agreement.

28 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory** 29 **Efforts**

30 Appendix 18A, *Archaeological Resources Sensitivity Assessment*, presents an overview of the
31 sensitivity of the Plan Area for previously unidentified archaeological resources and demonstrates
32 that additional prehistoric and historic-era sites that have not yet been identified are almost certain
33 to occur in the portion of the Plan Area where this alternative would be constructed. While surveys
34 will be completed for the footprint, once access is available, such surveys cannot guarantee that all
35 sites will be identified prior to construction. The rapid rate of at which alluvium and sediment
36 accumulates in the Delta region, and the geologically unstable nature of the floodplain and riverbank
37 environments in which these resources may occur, makes it likely that numerous sites are naturally
38 capped below surface soils. Cultural resource inventory efforts cannot always identify such
39 resources, even with exhaustive sampling methods designed to reveal sites with little or no surface
40 manifestation because subsurface sampling to identify every buried resource is economically and
41 technically infeasible. These sites may also occur buried at the depth at which tunnel boring
42 operations would be performed.

43 Many of these unidentified prehistoric resources are likely to qualify as historical resources, historic
44 properties, or unique archaeological resources because prehistoric sites in the Delta region tend to

1 be large and contain a rich material culture. In particular, burial features tend to be associated with
 2 numerous shell ornaments, charmstones, and associated grave goods. Habitation components often
 3 contain abundant faunal and floral remains that elucidate prehistoric adaptations such as
 4 subsistence methods.

5 In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era
 6 archaeological resources. Archaeological debris found in historic era archaeological sites activity is
 7 likely to be associated with significant themes such as agriculture, reclamation, and settlement of the
 8 Delta region. The size of the BDCP area and the intensity of historic activity suggest that some of
 9 these resources may qualify as historical resources, historic properties, or unique archaeological
 10 resources.

11 Ground-disturbing work, including the construction of surface features such as intakes, and the
 12 subterranean tunnel boring operations and shafts may disturb and damage these resources before
 13 they can be identified and avoided during monitoring efforts required under Mitigation Measure
 14 CUL-3. This damage and disturbance may materially impair these resources within the meaning of
 15 CEQA or adversely affect the resources within the meaning of Section 106 because this disturbance
 16 would impair the ability of these resources to yield data useful in research. While Mitigation
 17 Measure CUL-3 would reduce the potential for this impact, it would not guarantee the impact would
 18 be avoided entirely. Therefore, this impact is adverse.

19 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 20 sites that also may not necessarily be identified prior to construction. While cultural resource
 21 inventories will be completed once legal access is secured, no inventory can ensure that all
 22 resources are identified prior to construction. Because these sites may be eligible for the NRHP or
 23 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
 24 adverse.

25 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
 26 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
 27 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
 28 disrupt the spatial associations that contain scientifically useful information it would alter the
 29 potential basis for eligibility, thus materially altering the resource and resulting in a significant
 30 effect. Because these resources would not be identified prior to construction, they cannot be
 31 recorded and effects cannot be managed through construction treatment. Mitigation Measure CUL-3
 32 would reduce but not entirely avoid the potential for this impact, by implementing construction
 33 worker training, monitoring and discovery protocols. However, because archaeological resources
 34 may not be identified prior to disturbance through these measures, the effect cannot be entirely
 35 avoided. Therefore, this impact would remain significant and unavoidable.

36 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
 37 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

38 Prior to ground-disturbing construction, the BDCP proponents will include a cultural resources
 39 discovery plan in the contract conditions of the construction contractor, incorporating the
 40 following actions to be taken in the event of the inadvertent discovery of cultural resources.

- 41 • An archaeological monitor will be present to observe construction at geographic locations
 42 that are sensitive for unidentified cultural resources. Such locations consist of construction
 43 near identified sites (within a 100-foot radius around the known boundaries of identified

- 1 resources), and where ground-disturbing construction will occur within 500 feet of major
2 water features.
- 3 ● In the event of an archaeological resources discovery, work will cease in the immediate
4 vicinity of the find (typically 100-feet), based on the direction of the archaeological monitor
5 or the apparent distribution of cultural resources if no monitor is present. A qualified
6 archaeologist will assess the significance of the find and make recommendations for further
7 evaluation and treatment as necessary.
 - 8 ● Discovered resources will be mapped and described on forms provided by the California
9 Department of Parks and Recreation (DPR). Mapping will be performed by recording data
10 points with GPS hardware that can be imported and managed digitally.
 - 11 ● Evaluation and treatment will follow the standards and order of priority described above for
12 Mitigation Measure CUL-2. After receiving recommendations from the qualified
13 archaeologist, DWR and/or the appropriate federal agencies shall jointly determine the
14 feasibility of such recommendations, and particularly any recommended avoidance
15 measures, in light of factors such as costs, logistics, technological, and environmental
16 considerations and the extent to which avoidance is consistent with the objectives of the
17 project.
 - 18 ● If human remains are discovered as part of a larger cultural deposit, the BDCP proponents
19 and the contractors will coordinate with the county coroner and NAHC to make the
20 determinations and perform the management steps prescribed in California Health and
21 Safety Code Section 7050.5 and California PRC Section 5097.98.
 - 22 ● If Native American human remains are discovered on federal land, work in the immediate
23 vicinity will cease, and the BDCP proponents will contact the relevant representative of the
24 federal agency where the remains were discovered, as prescribed in 25 USC Section 3002(d)
25 (NAGPRA). After notification from the relevant agency representative and treatment of the
26 remains as required under NAGPRA, work may continue. Disposition of the remains will
27 follow the ownership priority described in NAGPRA (25 USC Section 3002[a]), as defined
28 below under Mitigation Measure CUL-4.
 - 29 ● DWR and/or the appropriate federal agencies shall provide pre-construction training of all
30 construction personnel engaged in construction that has the potential to affect
31 archaeological resources. This training will provide instruction on how to identify resources
32 in the field and appropriate measures to be taken if a discovery or potential discovery
33 occurs.

34 DWR will include a list of DWR cultural-resources staff that can respond to cultural resource
35 discoveries and provide management direction following discoveries in the construction
36 training materials, and will also provide this list as well as these discovery requirements to the
37 supervisory field staff for the construction workers.

38 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
39 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
40 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
41 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
42 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
43 into account through the implementation of this programmatic agreement.

1 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

2 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
 3 rather than as part of prehistoric or historic archaeological sites. Historic and prehistoric human
 4 remains have been discovered as isolated interments rather than as part of larger sites. Because
 5 these isolated resources are not associated with larger deposits, their distribution and depth cannot
 6 be estimated. Construction of this alternative would require ground-disturbing work that may
 7 damage previously unidentified human remains, resulting in direct effects on these resources. While
 8 inventory and monitoring efforts are prescribed under Mitigation Measures CUL-2, CUL-3, and CUL-
 9 4, the large acreages subject to disturbance under this alternative make exhaustive sampling to
 10 identify all buried and isolated human remains technically and economically infeasible. For these
 11 reasons the potential remains that such resources may be damaged or exposed before they can be
 12 discovered through inventory or monitoring. This effect would be adverse.

13 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 14 may occur either in isolation or as part of identified and previously unidentified archaeological
 15 resources where construction will occur. This effect would be adverse.

16 **CEQA Conclusion:** This impact would be significant. The Alternative 1A area is sensitive for buried
 17 human remains. Construction would likely result in disturbance of these features. Disturbance of
 18 human remains, including remains interred outside of cemeteries is considered a significant impact
 19 in the CEQA Appendix G checklist; therefore disturbance of these remains would result in a
 20 significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-
 21 than-significant level because mitigation would not guarantee that these features could be
 22 discovered and treated in advance of construction; the scale of construction makes it technically and
 23 economically infeasible to perform the level of sampling necessary to identify all such resources
 24 prior to construction. Therefore, this impact is considered significant and unavoidable.

25 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if** 26 **Such Resources Are Discovered during Construction**

- 27 • If human remains are discovered as part of a larger cultural deposit, the BDCP proponents
 28 and the construction contractors will coordinate with the county coroner and NAHC to make
 29 the determinations and perform the management steps prescribed in California Health and
 30 Safety Code Section 7050.5 and California PRC Section 5097.98. The provisions of these
 31 state laws apply unless discoveries occur on land owned or controlled by the federal
 32 government. For discoveries on federal land the bulleted procedures for NAGPRA, provided
 33 below shall be followed. Compliance with state law for discoveries occurring on private or
 34 state lands requires the following steps.
 - 35 ○ Notification of the county coroner so the coroner may determine if an investigation
 36 regarding the cause of death is required. If the coroner determines that the remains are
 37 of prehistoric Native American origin, the coroner will notify the NAHC.
 - 38 ○ Upon notification the NAHC will identify the MLD, and the MLD will be given the
 39 opportunity to reinter the remains with appropriate dignity. If the NAHC fails to identify
 40 the MLD or if the parties cannot reach agreement as to how to reinter the remains as
 41 described in California PRC Section 5097.98(e), the landowner will reinter the remains
 42 at a location not subject to further disturbance. The BDCP proponents will ensure the
 43 protections prescribed in California PRC Section 5097.98(e), are performed, such as the

1 use of conservation easements and recording of the location with the relevant county as
2 well as information center of the CHRIS.

- 3 ● If Native American human remains are discovered on federal land, work in the immediate
4 vicinity will cease, and the BDCP proponents will contact the relevant representative of the
5 federal agency where the remains were discovered, as prescribed in 25 USC Section 3002(d)
6 (NAGPRA). After notification from the relevant agency representative and treatment of the
7 remains as required under NAGPRA, work may continue. Disposition of the remains will
8 follow the ownership priority described in NAGPRA (25 USC Section 3002[a]):
 - 9 ○ Where the lineal descendants can be found, the lineal descendants own the remains.
 - 10 ○ Where the lineal descendants cannot be found, the remains belong to the Indian tribe on
11 whose land the remains were found.
 - 12 ○ If the remains are discovered on other lands owned or controlled by the federal
13 government and the lineal descendants cannot be determined, the remains belong to the
14 Indian tribe that is culturally affiliated with the remains, or the tribe that aboriginally
15 occupied the land where the remains were discovered.
 - 16 ○ “Indian Tribe” here means federally recognized tribes identified in the list of such tribes
17 published by the Bureau of Indian Affairs in the *Federal Register* as well as in the tribal
18 directory compiled by the BIA.

19 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
20 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
21 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
22 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
23 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
24 into account through the implementation of this programmatic agreement.

25 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic** 26 **Architectural/Built-Environment Resources Resulting from Construction Activities**

27 Built-environment resources that may be affected by this alternative include resources identified
28 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
29 for the BDCP. Some resources are considered historic properties for the purposes of this analysis
30 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For
31 similar reasons some are considered historical resources under CEQA. As identified in Appendix
32 18B, Table 18B-2, a total of 24 built-environment resources have the potential to be directly or
33 indirectly affected by construction of this alternative. The specific nature and location of the impact
34 mechanism for each affected resource is also described in Table 18B-2. These resources are spatially
35 distributed across the alignment, but are clustered to some extent, either where large project
36 features such as intakes and the intermediate forebay occur, or where the alignment approaches
37 small towns and other concentrations of resources such as the town of Walnut Grove. The affected
38 resources have been evaluated for the NRHP and CRHR. The basis for the eligibility
39 recommendations for each resource is provided in Appendix 18B, in Section B.1.3, *Built Environment*
40 *Resource Descriptions*.

1 Discussion of Anticipated Effects on Identified and Accessible Resources

2 Direct effects would result from demolition of resources to construct features such as intakes or
 3 other improvements. Indirect effects would result where resources would remain, but the nearby
 4 setting would be altered by new inconsistent structures such as intakes or transmission lines.
 5 Modification of resources may result in direct effects. The exact effect mechanism for each resource
 6 is described in Appendix 18B, in Table 18B-2. Facility redesign to avoid direct impacts on historic
 7 architectural resources is preferred as mitigation if possible. However, it is unlikely that all
 8 identified resources can be avoided because of the scale of the BDCP and the need to balance
 9 avoidance of other important environmental resources such as wetlands, natural communities, and
 10 special-status species habitat. These effects would materially impair the resources within the
 11 meaning of CEQA and result in adverse effects within the meaning of Section 106 because they
 12 would diminish the characteristics that convey the significance of the resources. Some direct
 13 demolition and indirect effects such as setting changes are likely to occur even with mitigation.
 14 Therefore, these effects would be adverse.

15 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
 16 built environment resources. These alterations may diminish the integrity of these resources. For
 17 these reasons this effect would be adverse.

18 **CEQA Conclusion:** Historic-era built-environment resources have been identified in the footprint of
 19 this alternative (24 individual resources, as described in Appendix 18B, Table 18B-2). These
 20 resources have been evaluated for the CRHR and qualify as historical resources under CEQA.
 21 Construction of conveyance facilities may require demolition of the historic built-environment
 22 resources. Construction may also result in permanent indirect effects such as changes to the setting.
 23 Direct demolition or changes to the setting would be material alterations because they would either
 24 remove the resource or alter the resource character, resulting in an inability of the resource to
 25 convey its significance. For these reasons this would be a significant effect. Mitigation described
 26 below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of
 27 the BDCP and the constraints imposed by other environmental resources make avoidance of all
 28 significant effects unlikely. For these reasons this impact remains significant and unavoidable even
 29 with implementation of the following mitigation measures.

30 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and Implement a Built** 31 **Environment Treatment Plan**

32 All mitigation will be undertaken by individuals who meet the Secretary of the Interior's
 33 professional qualifications and have demonstrable experience conducting the following
 34 recommended measures. In preparation of the built environment treatment plan measures
 35 relevant parties will be consulted. Such parties may include but are not limited to the State
 36 Historic Preservation Officer (SHPO), the Advisory Council on Historic Preservation (ACHP),
 37 local historical societies, and other interested parties such as local preservation and community
 38 organizations. The BDCP proponents will perform the following measures as part of mitigation
 39 and monitoring for compliance with CEQA. Appropriate federal agencies shall perform these
 40 measures as part of their management responsibilities performed to satisfy Section 106 of the
 41 NHPA. Property specific mitigation is identified in Tables 18B-17 through 18B-31 and shall be
 42 implemented. Typical mitigation for affected and eligible properties consists of the following:

43 A built environment treatment plan (BETP) will be prepared by an architectural historian with
 44 demonstrated experience preparing treatment for similar kinds of resources, and reviewed by

1 relevant parties prior to any demolition or ground-disturbing activity for all CRHR- and NRHP-
 2 eligible built-environment resources subject to adverse effects or significant impacts. The
 3 following protective measures and monitoring protocols will be implemented for historic
 4 resources in close proximity to the project but that are not anticipated to be directly affected by
 5 demolition or construction but which may be subject to direct effects such as vibration or
 6 inadvertent damage activities:

- 7 ● Historic Structures Reports (HSR) will be prepared for buildings and structures adjacent to
 8 the project for which detailed information is required to develop protection measures.
 9 These will be done for buildings and structures that appear to be in poor condition and,
 10 therefore, potentially sensitive to construction-related activities such as vibration.
 11 Preconstruction stabilization or temporary removal of these buildings may be necessary.
- 12 ● Preconstruction condition assessments will be prepared for buildings and structures
 13 adjacent to the project that are stable, but could be unintentionally damaged during
 14 construction. Should there be any question as to whether or not the project caused damage,
 15 these condition assessments will provide confirmation of the preconstruction condition.
- 16 ● Precautions to protect built resources from construction vehicles, debris and dust may
 17 include fencing or debris meshing. Temporary mothballing, and fire and intrusion
 18 protection may be needed if the buildings are unoccupied during construction.
- 19 ● Protective measures will be field checked as needed during construction by a qualified
 20 architectural historian with demonstrated experience conducting monitoring of this nature.
 21 Vibration monitoring may be required for buildings determined to be susceptible to
 22 vibration damage that are in close proximity to construction activities or machinery that
 23 cause vibration.
- 24 ● These measures are designed to avoid direct effects such as vibration that may result in
 25 structural damage or inadvertent direct effects such as demolition.
- 26 ● Redesign of relevant facilities will be used to avoid destruction or damage where feasible,
 27 taking into account costs, logistics, technological and environmental considerations, and the
 28 extent to which avoidance is consistent with the objectives of the project.

29 For built resources that will be directly and adversely impacted, mitigation typically includes:

- 30 ● Historic American Building Survey (HABS) records will be prepared for CRHR- and NRHP-
 31 eligible buildings and structures that will be demolished (National Park Service 2000).
 32 These reports will include written and photographic documentation of the significant and
 33 character-defining features of these properties. These reports will minimize the adverse
 34 effect by capturing and preserving a description of the significant information and
 35 characteristics associated with the resource.
- 36 ○ All HABS reports are subject to review and approval by the National Park Service.
 37 Following approval, the BDCP lead agencies will produce sufficient copies for
 38 distribution to identified repositories, including the Library of Congress, the California
 39 State Library, the University of California Water Resources Center Archives, and any
 40 local repositories, as appropriate and agreed upon with the SHPO and interested parties.
 41 Distribution will further enhance the mitigation of the adverse effect because it will
 42 ensure that the significance is retained and conveyed to a wide audience.

- 1 • As applicable, Historic American Landscape Survey (HALS) records and Historic American
2 Engineering Record (HAER) documents will be prepared for historic water-associated
3 resources (National Park Service 2005). The levees and other linear CRHR- and NRHP-
4 eligible features will be recorded following HAER guidelines. Additionally the settings will
5 be recorded following HALS guidelines. These reports will include written and photographic
6 documentation of the significant and character-defining features of these properties. The
7 HALS and HAER reports will minimize the adverse effect by capturing and retaining a
8 description of the significant engineering and design information associated with the
9 resource.
- 10 ○ All HALS/HAER reports are subject to review and approval by the National Park Service.
11 Following approval, the BDCP lead agencies will produce sufficient copies for
12 distribution to identified repositories, including the Library of Congress, the California
13 State Library, the University of California Water Resources Center Archives, and any
14 local repositories, as appropriate and agreed upon with the SHPO and interested parties.
15 Distribution will further enhance the mitigation of the adverse effect because it will
16 ensure that the significance is retained and conveyed to a wide audience.
- 17 • Salvage of materials will be performed to the extent feasible to enable the restoration of
18 similar buildings, structures, or water-conveyance features outside of the area of direct
19 impact. Salvage will further minimize adverse effects by using salvaged materials to ensure
20 that similar resources are restored and maintained in manner that will ensure the
21 significance of the resource is preserved.

22 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
23 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
24 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
25 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
26 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
27 into account through the implementation of this programmatic agreement.

28 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic** 29 **Architectural/Built-Environment Resources Resulting from Construction Activities**

30 Because DWR does not have legal access to the majority of the footprint for this alternative,
31 inventory efforts in the entire footprint have not been completed. Nonetheless, the intensity of
32 activity in the Delta region during the historic era and a review of available data such as aerial
33 photographs suggest that numerous additional resources occur in the footprint that have not been
34 identified or which cannot currently be accessed and evaluated.

35 Review of available data such as aerial photographs, historic topographic maps, and assessors'
36 records also indicates that many of these inaccessible properties are 45 years of age or older and
37 have the potential to be eligible historic resources. Approximately 71 unevaluated built-
38 environment resources have been identified in the footprint of this alternative (ICF 2012, see tables
39 of inaccessible properties and associated maps). Many of these resources are likely to be significant
40 because they may be associated with the important historical themes described above in Section
41 18.1.6, *Historic-Era Setting*. In addition, such resources may be associated with historically
42 significant persons, or may represent significant artistic values. Thus the resources may have
43 significance under both CEQA (State CEQA Guidelines Section 15064.5[a][3]) and the NRHP (30 CFR
44 60.4). In addition, because many of the historic-era structures in the Delta region are intact, and

1 retain their rural agricultural setting, many of these resources are likely to have integrity within the
2 meaning of CEQA and the NRHP (14 CCR Section 4852[c], 30 CFR 60.4). Because many unidentified
3 resources are likely to have significance and integrity, they may qualify as historical resources under
4 CEQA and historic properties under Section 106 of the NHPA.

5 **Anticipated Effects**

6 Construction may result in direct demolition of these resources, damage through vibration, or
7 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
8 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
9 guarantee that eligible resources would be avoided and that adverse changes to the setting would
10 not occur. The scale of the BDCP and other design constraints, such as the presence of other
11 important environmental resources, makes avoidance of all direct and indirect effects unlikely.
12 Therefore, this effect would be adverse.

13 TCPs may also occur within the footprint of this alternative. These resources consist of built
14 environment features or activity areas that are important in the cultural life of a living community.
15 Examples of such resources include local gathering halls and Native American traditional activity
16 areas. Where these resources have both integrity of condition and integrity of relationship, and meet
17 the criteria for listing in the NRHP, they can qualify as historic properties (National Park Service
18 1998:11–12). Resources that are NRHP-eligible would also be historical resources under CEQA
19 (California PRC Section 5024.1[d][1]). Construction has the potential to directly or indirectly
20 damage such resources through demolition or introduction of new inconsistent features into the
21 setting. These changes would impair the ability of the resources to convey their significance because
22 the character defining elements or setting of the resource would be lost. Therefore, impacts on these
23 resources may be adverse.

24 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting
25 for inaccessible and NRHP and CRHR-eligible built environment resources. These changes may
26 diminish the integrity of these resources. For these reasons, this effect would be adverse.

27 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
28 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
29 efforts have not gathered complete information in these inaccessible areas. Many of these resources
30 are likely to be associated with important historical themes or persons, or possess high creative
31 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
32 these resources remain intact and retain their rural agricultural setting they are also likely to have
33 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
34 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
35 demolition of the historic built-environment resources. Construction may also result in permanent
36 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
37 material alterations because they would either remove the resource or alter the resource character,
38 resulting in an inability of the resource to convey its significance. For these reasons this would be a
39 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
40 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
41 environmental resources make avoidance of all significant effects unlikely. For these reasons this
42 impact remains significant and unavoidable even with implementation of the following mitigation
43 measures.

1 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess**
 2 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and**
 3 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

4 Because DWR does not have legal access to the majority of the footprint for this alternative, a
 5 built resources inventory has not been completed for the entire footprint for this alternative.
 6 Prior to construction, the BDCP proponents will ensure that an inventory and evaluation report
 7 is completed within all areas where effects on built resources may occur. This subsequent
 8 survey will be conducted in a manner consistent with the May–June 2012 survey.

- 9 ● The scope of the inventory will include the entire area where effects may occur that were
 10 inaccessible or partially inaccessible in the first survey efforts. Such effects consist of direct
 11 disturbance, damage through vibration, or changes to the setting.
- 12 ● The work will be led or supervised by architectural historians that meet the Secretary of the
 13 Department of the Interior’s professional qualification standards provided in 36 CFR 61.
- 14 ● Inventory methods and evaluation will include pedestrian surveys, photographic
 15 documentation, historical research using both primary and secondary sources, and
 16 interviews and oral histories.
- 17 ● Newly identified resources will be mapped and described on forms provided by the DPR.
 18 Mapping will be performed by recording data points with GPS hardware that can be
 19 imported and managed digitally.
- 20 ● For all identified resources, the BDCP proponents will evaluate the resources to determine if
 21 they are any of the following.
 - 22 ○ Historical resources (State CEQA Guidelines Section 15064.5[a])
 - 23 ○ Significant historic resources under CEQA (California PRC Section 21084.1)
 - 24 ○ Historic properties (36 CFR 60.4)
 - 25 ○ Eligible for local registers
- 26 ● The recorded resources and the resource evaluations will be summarized in an inventory
 27 report. In the inventory report, the BDCP proponents will also determine if individual
 28 resources qualifying as historical resources or historic properties will be subject to
 29 significant effects. DWR will make such a finding if the BDCP would result in the following.
 - 30 ○ Demolish or materially alter the qualities that make the resource eligible for listing in
 31 the CRHR (State CEQA Guidelines Section 15064.5[b][2][A],[C]).
 - 32 ○ Demolish or materially alter the qualities that justify the inclusion of the resource on a
 33 local register or its identification in an historical resources survey meeting the
 34 requirements of California PRC Section 5024.1(g), unless DWR establishes by a
 35 preponderance of evidence that the resource is not historically or culturally significant
 36 (State CEQA Guidelines Section 15064.5[b][2][B]).
 - 37 ○ Alter, directly or indirectly, the qualities that make a resource eligible for listing in the
 38 NRHP (36 CFR 800.5[a][1]).
 - 39 ○ Cause a substantial adverse change in the significance of an historical resource
 40 (California PRC Section 21084.1).

1 Where built-environment resources that are listed or qualify for listing in the CRHR or NRHP, or
 2 that have been designated as locally significant, or are otherwise identified by the BDCP
 3 proponents as historical resources will be subject to significant effects, the BDCP proponents
 4 will prepare a BETP. The treatment plan will provide detailed descriptions of treatment
 5 measures that will be implemented to avoid, protect, minimize, and mitigate adverse effects on
 6 historic properties in accordance with the Secretary of the Interior's Standards for the
 7 Treatment of Historic Properties (36 CFR 68) and the National Park Service's Guidelines for the
 8 Treatment of Cultural Landscapes. The treatment plan will describe work to be done prior to,
 9 during, and after construction.

- 10 • Where feasible in light of costs, logistics, technological and environmental considerations,
 11 and the extent to which avoidance is consistent with the objectives of the project, The BDCP
 12 proponents will first seek to avoid demolition or materially altering the historical resource
 13 by avoidance measures, such as the following.
 - 14 ○ Construction condition assessments or HSRs of properties adjacent to construction to
 15 determine if these properties are at risk of being damaged.
 - 16 ○ Redesign of relevant facilities to avoid destruction or damage.
 - 17 ○ Determination of tolerable levels of construction vibration.
 - 18 ○ Stabilization design and implementation to ensure fragile built resources are not
 19 damaged by construction activities.
 - 20 ○ Temporarily moving built resources, or other measures determined appropriate.
- 21 • If avoidance is not feasible, the BDCP proponents will implement treatment measures such
 22 as, but not limited to the following examples of treatments used to minimize effects on built-
 23 environment resources.
 - 24 ○ Redesign of relevant facilities to minimize the scale or extent of damage to eligible or
 25 listed built resources.
 - 26 ○ Design standards to minimize the visual impact and to ensure context-appropriate
 27 design.
 - 28 ○ Complete documentation in accordance with HABS/HAER/HALS programs, including
 29 written and photographic documentation of the significant qualities of the CRHR and
 30 NRHP listed and determined eligible districts or individually eligible resources (where
 31 resources cannot be avoided).
 - 32 ○ Relocation of historic buildings that would otherwise be demolished.
 - 33 ○ Following the Secretary of the Interior's standards to restore built resources outside of
 34 the area of direct effect that are of the same type as resources that will be demolished by
 35 the BDCP.
 - 36 ○ Other appropriate treatment methods that are identified in relation to particular
 37 resources that are affected.

38 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service,
 39 and the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
 40 California State Historic Preservation Officer for the implementation of NHPA Section 106
 41 for their undertakings associated with the BDCP. The effects of Federal undertakings

1 (actions) on historic properties (eligible for or listed on the National Register of Historic
 2 Places) will be taken into account through the implementation of this programmatic
 3 agreement.

4 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

5 This impact describes the potential effects of other conservation measures at a program level of
 6 detail, with the exception of *CM1 Water Facilities and Operation*. The following conservation
 7 measures would not result in impacts on cultural resources because they consist of changes to
 8 existing activities, or planning and regulatory actions that do not have the potential to result in
 9 ground-disturbing work with effects on cultural resources.

- 10 ● *CM11: Natural Communities Enhancement and Management*
- 11 ● *CM12: Methylmercury Management*
- 12 ● *CM13: Invasive Aquatic Vegetation Control*
- 13 ● *CM14: Stockton Deep Water Ship Channel Dissolved Oxygen Levels*
- 14 ● *CM15: Predator Control*
- 15 ● *CM16: Nonphysical Fish Barriers*
- 16 ● *CM17: Illegal Harvest Reduction*
- 17 ● *CM19: Urban Stormwater Treatment*
- 18 ● *CM20: Recreational Users Invasive Species Program*
- 19 ● *CM21: Nonproject Diversions*
- 20 ● *CM22: Avoidance and Minimization Measures*

21 Implementation of the remaining conservation measures could result in effects on prehistoric and
 22 historic archaeological resources, as well as TCPs and the built environment because the scope of
 23 conservation actions includes large areas of land, and the areas identified for potential restoration
 24 or other conservation actions are sensitive for cultural resources, including prehistoric and historic
 25 archaeological sites as well as human remains, architectural resources, and rural historic
 26 landscapes. Specific conservation actions that could result in foreseeable ground-disturbing work
 27 that could alter or impair the significance of NRHP-, CRHR-, or local registry-eligible cultural
 28 resources are listed below.

- 29 ● *CM2: Yolo Bypass Fisheries Enhancement*
- 30 ● *CM3: Natural Communities Protection and Restoration*
- 31 ● *CM4: Tidal Natural Communities Restoration*
- 32 ● *CM5: Seasonally Inundated Floodplain Restoration*
- 33 ● *CM6: Channel Margin Enhancement*
- 34 ● *CM7: Riparian Natural Community Restoration*
- 35 ● *CM8: Grassland Natural Community Restoration*
- 36 ● *CM9: Vernal Pool Complex Restoration*
- 37 ● *CM10: Nontidal Marsh Restoration*

1 • *CM18: Conservation Hatcheries*

2 These measures would result in effects on cultural resources when ground-disturbing work is
3 performed to construct improvements and enhance or restore natural communities. Direct effects
4 would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible
5 prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and
6 built-environment resources. Indirect effects may occur where changes to the setting alter the
7 existing setting in a manner that is inconsistent with the feeling and association of the resource. For
8 example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the
9 themes of agriculture and settlement, and thus would be inconsistent with remaining features
10 associated with rural historic landscapes created by reclamation, cultivation, and ranching.

11 Because of the large acreages of land included in all conservation measures that would be
12 implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local
13 registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact
14 would be adverse. These effects would be material alterations and adverse changes because
15 demolition or alteration of the setting would diminish or destroy the ability of these resources to
16 convey their significance. Mitigation Measure CUL-7 below addresses this effect.

17 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
18 introduction of new infrastructure to the Plan Area. These physical modifications may result in
19 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
20 integrity of these resources. For these reasons these effects would be adverse.

21 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
22 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
23 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
24 built-environment resources such as historic architectural structures and rural historic landscapes.
25 The same construction may damage unique archaeological sites. This construction would likely
26 result in materially adverse changes for the following reasons.

- 27 • Ground-disturbing construction in archaeological sites disrupts the spatial associations that
28 contain data useful in research, thus diminishing or destroying the basis for the significance of
29 the resource, and;
- 30 • Ground-disturbing construction may either directly demolish or indirectly affect the setting of
31 built-environment resources, resulting in an inability of the resource to convey its significance,
32 and;
- 33 • Ground-disturbing construction may either directly demolish or change the setting of TCPs
34 resulting in an inability of the resource to convey its significance.
- 35 • Ground-disturbing construction may inadvertently disturb human remains.

36 The alteration of a resource that changes the characteristics that convey its significance is a material
37 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
38 CEQA under the Appendix G checklist. Because this construction would materially alter these
39 categories of resources and disturb human remains it would result in a significant impact. Mitigation
40 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
41 where possible, and developing treatment where avoidance is not possible. In addition construction
42 would be monitored. However, because of the acreage associated with the proposed restoration
43 under conservation measures, as well as the multiple constraints associated with other

1 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
2 resources could be avoided. Therefore, this impact remains significant and unavoidable.

3 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
4 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
5 **Implementation of Conservation Measures 2–22**

6 As part of the site-specific environmental review for all conservation measures other than *CM1*
7 *Water Facilities and Operation* that could involve adverse effects on cultural resources within the
8 meaning of NEPA, or significant impacts on cultural resources within the meaning of CEQA, DWR
9 and/or the federal lead agencies will conduct cultural resource studies and develop mitigation
10 measures. The cultural resource studies will include the following steps.

- 11 • Record searches at the relevant information centers of the CHRIS to retrieve records of
12 identified resources. Inventories will consist of surveys using both historical and map
13 research as well as field-inspection. Evaluation will consist of assessment of identified
14 resources to determine if they have both significance and integrity sufficient to qualify for
15 the CRHR, and NRHP, as well as any relevant local registers.
- 16 • Cultural resource inventories and evaluations that identify archaeological resources and
17 built-environment resources.
- 18 • Correspondence or discussion with the Native American contacts on file with the NAHC and
19 relevant tribes from the list of relevant federally recognized tribes that qualify as *Indian*
20 *tribes*, as used in 36 CFR 800.16(m), maintained by the Bureau of Indian Affairs (BIA), in
21 order to identify resources that may be known to the Native American community, and to
22 incorporate their preferences for treatment and management.
- 23 • Resource-specific evaluations that apply the criteria to determine if the identified resources
24 qualify as historical resources (State CEQA Guidelines Section 15064.5[a]) or unique
25 archaeological resources under CEQA (California PRC Section 21083.2[g]), historic
26 properties (36 CFR 60.4), or are eligible for local registers.
- 27 • Resource-specific treatment for historical resources, unique archaeological resources, and
28 historic properties that would be materially impaired as defined in CEQA (State CEQA
29 Guidelines Section 15064.5[b][1]) or adversely affected, as defined in the Section 106
30 regulations (36 CFR 800.5[a][1]).

31 Treatment and mitigation will include the following elements and steps.

- 32 • Treatment for archaeological resources qualifying as historical resources that are subject to
33 significant effects will follow the order of preference described in State CEQA Guidelines
34 Section 15126.4[b][3].
- 35 • Treatment for unique archaeological resources subject to significant effects will conform to
36 the mitigation prescribed under CEQA (California PRC Section 21083.2[b])
- 37 • Treatment for historic properties subject to adverse effects will seek to avoid or minimize
38 the consequences of the BDCP that would diminish the characteristics that make the historic
39 property eligible for inclusion in the NRHP.
- 40 • Treatment plans or mitigation measures in environmental documents will include
41 monitoring and discovery plans that provide for observation of construction to avoid

1 inadvertent effects on previously unidentified human remains and cultural resources, to the
2 extent feasible.

- 3 ● Treatment plans or mitigation measures in environmental documents will also include the
4 notification and consultation provisions required for discoveries of human remains
5 provided in California Health and Safety Code Section 7050.5 and California PRC Section
6 5097.98.
- 7 ● If Native American human remains are discovered on federal land, work in the immediate
8 vicinity will cease and the BDCP proponents will contact the relevant representative of the
9 federal agency where the remains were discovered, as prescribed in 25 USC Section 3002(d)
10 (NAGPRA). After notification from the relevant agency representative and treatment of the
11 remains as required under NAGPRA, work may continue. Disposition of the remains will
12 follow the ownership priority described in NAGPRA (25 USC Section 3002[a]).
- 13 ● For federal agency undertakings, management will be coordinated through a PA and
14 memoranda of agreement, as described above in 18.2.1.3, *Section 106 Compliance for the*
15 *BDCP*.

16 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
17 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
18 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
19 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
20 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
21 into account through the implementation of this programmatic agreement.

22 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other** 23 **Conservation Measures with Plans and Policies**

24 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
25 result in the potential for incompatibilities with plans and policies related to protecting cultural
26 resources of the Delta. A number of plans and policies that coincide with the study area provide
27 guidance for protection of cultural resources as overviewed in *Section 18.2.3, Regional and Local*
28 *Plans, Policies, and Regulations*. This overview of plan and policy compatibility evaluates whether
29 Alternative 1A is compatible or incompatible with these policies, rather than whether impacts are
30 adverse or not adverse or significant or less than significant. The physical and indirect effects of the
31 alternatives on cultural resources are address in Impacts CUL-1 through CUL-7, as described for
32 each alternative. The following comparison analyzes the compatibility of the BDCP with the cultural
33 resource preservation plans and policies of the cities and counties in the region that have adopted
34 such policies. In general, these policies fall into two categories; policies that emphasize preservation
35 or mitigation for effects on significant cultural resources, and policies that specifically emphasize or
36 favor preservation as the preferred management method. For policies that emphasize preservation
37 or mitigation the BDCP will be compatible with these policies for the reasons described below. For
38 policies that emphasize preservation the BDCP is incompatible in some instances because multiple
39 constraints governing the location of proposed facilities makes preservation of all significant
40 cultural resources unlikely.

- 41 ● The Alameda County East Area Plan requires that Alameda County design development to avoid
42 cultural resources that contribute to the heritage of the County, or in the alternative to include
43 mitigation to offset impacts to those resources (Alameda County 2000:36). Because the BDCP
44 includes mitigation measures requiring identification of cultural resources, evaluation for the

1 CRHR and NRHP, and mitigation to reduce unavoidable effects, the BDCP would be compatible
2 with this policy.

- 3 ● The Contra Costa County General Plan encourages identification and preservation of important
4 cultural resources, preferably in public ownership. While other general plans and policies
5 typically encourage preservation or mitigation, the Contra Costa County General Plan
6 emphasizes preservation (Contra Costa County 2005: 9-11). While the BDCP will require
7 identification, evaluation, and mitigation to the extent feasible, the preservation of all affected
8 cultural resources is infeasible because conflicting constraints such as the location of other
9 significant environmental resources make such avoidance unlikely in every instance. For this
10 reason, the BDCP is not compatible with the Contra Costa County General Plan.
- 11 ● San Joaquin County has adopted cultural resource protection policies as part of their general
12 plan (San Joaquin County 1992:VI-37). These policies require identification of cultural resources
13 prior to construction where feasible, and assessment of resources identified during construction
14 so that appropriate mitigation may be implemented. The BDCP would be compatible with these
15 policies because cultural resource inventories are in progress for the BDCP, and this section
16 identifies mitigation measures and consultation that will be conducted to manage effects on
17 cultural resources.
- 18 ● The Sacramento County General Plan includes policies encouraging preservation of important
19 buildings, bridges, and other important structures (Sacramento County 2011:80). The General
20 Plan requires that projects involving structures or districts of architectural importance are
21 referred to the Cultural Resources Committee of the County to recommend appropriate
22 mitigation. The BDCP would be potentially incompatible with these policies because the scale of
23 the project and the constraints associated with mitigation and avoidance for other resources
24 makes protection and avoidance of all significant architectural resources unlikely.
- 25 ● The Solano County General Plan encourages identification and preservation of important
26 archaeological and built-environment resources (Solano County 2008:RS-43). The BDCP would
27 be potentially incompatible with these policies because the scale of the project and the
28 constraints associated with mitigation and avoidance for other resources makes protection and
29 avoidance of all significant architectural resources unlikely.
- 30 ● The Yolo County General Plan requires identification of important cultural resources,
31 consultation with Native Americans that attach significance to these resources, and avoidance or
32 mitigation for important cultural resources affected by development (County of Yolo 2009a:CO-
33 55 to CO-56). The General Plan also requires that permitted land uses in the Primary Zone of the
34 Delta are consistent with the policies of the Land Use and Resource Management Plan of the
35 Delta Protection Commission, but these policies do not have specific provisions for cultural
36 resources. The BDCP would be compatible with these policies because cultural resource
37 inventories are in progress for the BDCP, and this section identifies mitigation measures and
38 consultation that will be conducted to manage effects on cultural resources.
- 39 ● The Yolo County General Plan also encourages the preservation and protection of cultural
40 resources where feasible and consultation with Native American tribes (County of Yolo
41 2009a:CO-55). The plan specifically encourages identification efforts, avoidance and mitigation
42 to the maximum extent feasible, and consultation with tribes that attach significance to those
43 resources. Because the BDCP includes mitigation measures requiring identification of cultural
44 resources, evaluation for the CRHR and NRHP, consultation with Native American individuals

1 and organizations, and mitigation to reduce unavoidable effects, the BDCP would be compatible
2 with this policy.

3 It should be noted that incompatibility with land use policies, is not, by itself, a physical effect on the
4 environment. It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal
5 agencies are not subject to local land use regulations.

6 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
7 alternatives would not result in a conflict with local land use laws.

8 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
9 the various counties with jurisdiction in this region. For policies that emphasize preservation or
10 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
11 agencies will implement cultural resource management practices that will identify significant
12 resources, preserve such resources where feasible, and complete mitigation to reduce significant
13 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
14 incompatible in some instances because multiple constraints governing the location of proposed
15 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
16 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
17 regulations.

18 **18.3.5.3 Alternative 1B—Dual Conveyance with East Alignment and Intakes** 19 **1–5 (15,000 cfs; Operational Scenario A)**

20 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of** 21 **Conveyance Facilities**

22 **Identified Resources**

23 Record searches at the CHRIS and inventory efforts for the BDCP have identified 17 previously
24 recorded archaeological sites in the footprint of this alternative as described in Appendix 18B, Table
25 18B-1. Detailed site descriptions summarizing available information regarding these resources, are
26 provided in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*. These sites are distributed
27 more heavily towards the northern and southern end of the alignment.

28 **Significance of Identified Archaeological Resources**

29 Many of the directly affected sites are midden sites, with debris and artifacts associated with
30 prehistoric habitation and residence activities. Midden sites in the Plan Area are often colloquially
31 referred to as “mound sites” because they often form low mounds elevated relative to the
32 surrounding landform. While the original raised deposit has sometimes been destroyed, midden
33 sites often have substantial deposits below the original raised landform that remain intact that
34 typically contain the material remains associated with prehistoric habitation. This organic debris
35 can be used for radiocarbon dating, as well as material that reveals the nature of subsistence
36 activities pursued by prehistoric populations. Because there is no single unified prehistoric
37 chronology for the Delta region, substantial research questions remain unresolved regarding nature
38 and changes of subsistence and settlement activity over the span of the prehistoric occupation of the
39 Delta. The Delta is the prehistoric point of articulation between Central Valley cultures and the
40 aboriginal people that occupied the San Francisco Bay area. Because the cultural chronology and
41 sources of cultural change for the Delta remain unresolved in part, sites in the footprint of this

1 alternative likely contain information that could help clarify these research issues. For this reason
2 these resources are likely significant under the fourth criterion for the CRHR and NRHP.

3 Six of the identified sites contain human burials, as described on the site records. Most if not all of
4 the remaining sites are likely to contain additional burials because midden sites in the Plan Area
5 typically contain human burials or cremations. Burial components within these sites often contain
6 ornaments and other personal items such as charmstones, beads, and other decorative material.
7 Because the style and form of these artifacts change throughout prehistory, and because these
8 stylistic changes have been defined, these materials provide a method of associating archaeological
9 material with specific prehistoric time periods. The ability to associate habitation remains with
10 specific time periods is one of the most significant problems in prehistoric research, because the
11 sequence of specific adaptations and behaviors only becomes clear when a chronology can be
12 constructed that associates behavior and material culture with specific time frames. For this reason
13 these resources are likely significant under the fourth criterion for the CRHR and NRHP.

14 Because many of these resources are large (typically in excess of 30 meters across), they are each
15 likely to contain some portion of the deposit with sufficient integrity to yield artifacts in their
16 original associations in a manner that will convey these significance themes. Therefore these
17 identified resources are likely to qualify as historical resources under CEQA. For the same reasons,
18 these resources are likely to qualify as historic properties under the NRHP.

19 **Anticipated Effects on Identified Resources**

20 The exact location of these resources cannot be disclosed because such disclosure might lead to
21 inadvertent damage. However these resources occur within the footprint of both temporary work
22 areas and permanent surface impacts. These sites are distributed more heavily towards the
23 northern and southern end of the alignment. Ground-disturbing construction is likely to disturb the
24 deposits and thus materially alter their ability to convey their significance. Much of the data
25 potential in archaeological resources exists in the spatial associations of different artifacts and other
26 cultural material. Where artifacts that have known associations with particular time periods occur
27 adjacent to other material such as faunal bone or plant remains from subsistence activity, the
28 proximity of the materials allows an inference as to the age of the subsistence remains, thereby
29 allowing researchers to infer particular subsistence strategies during different prehistoric periods.
30 Intrusive ground-disturbing construction, vibration, and other physical disturbance may disrupt
31 these associations and thus disrupt the qualities for which the sites may qualify as historical
32 resources or historic properties. In addition, because not all identified resources are legally
33 accessible, these resources may be significant for other reasons than their data potential. Indirect
34 effects such as introduction of changes to the setting associated with construction of new features or
35 creation of new sources of noise (also a change to the setting) may diminish the basis for the
36 significance of these resources. For these reasons, construction has the potential to materially
37 impair these resources under CEQA and to adversely affect the resources as defined by Section 106
38 of the NHPA. This effect would be adverse.

39 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
40 damage these resources. This damage may impair the integrity of these resources and thus reduce
41 their ability to convey their significance. For these reasons this effect would be adverse.

42 **CEQA Conclusion:** Construction of conveyance facilities would affect identified 17 archaeological
43 resources that occur in the footprint of this alternative. DWR identified these resources and finds
44 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions

1 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
 2 potential to qualify as historical resources. Therefore, these sites are considered historic resources
 3 for the purposes of CEQA. This impact would be significant because construction could materially
 4 alter or destroy the potential of these resources to yield information useful in archaeological
 5 research, the basis for the significance of these resources, through excavation and disruption of the
 6 spatial associations that contain meaningful information. Identified but currently inaccessible
 7 resources may also be significant under other register criteria; indirect effects such as introduction
 8 of new inconsistent changes to the setting may also diminish the significance of these resources.
 9 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
 10 scientifically important material would be retrieved because feasible archaeological excavation only
 11 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
 12 important information. Construction could damage these remaining portions of the deposit.
 13 Therefore, this impact is significant and unavoidable.

14 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
 15 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
 16 **Archaeological Sites**

17 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

18 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory**
 19 **Efforts**

20 This impact is generally similar to Impact CUL-2 described under Alternative 1A. This alternative is
 21 sensitive for previously unidentified archaeological resources that are likely to be significant and to
 22 have integrity for the same reasons as described under Alternative 1A. It should be noted however,
 23 that the eastern canal would cross more sensitive soil formations and result in continuous ground-
 24 disturbance than Alternative 1A, which consists of a tunnel, and Alternative 1C which makes use of a
 25 tunnel for a portion of the conveyance alignment. This results in a slightly greater potential to affect
 26 prehistoric archaeological resources compared to Alternative 1A and 1C. Figure 1 in Appendix 18A
 27 depicts the eastern canal relative to archaeologically sensitive soil formations. The general
 28 sensitivity for historic-era archaeological resources is similar to Alternative 1A.

29 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 30 resources by disrupting the spatial associations that convey data useful in research or changing the
 31 setting such that the resource no longer contains its significance. The locations of ground-disturbing
 32 features such as the canal, access roads, pumping plants, borrow areas and concrete batch plants are
 33 depicted in Figure M3-2 in the mapbook volume. These impacts would thus materially impair these
 34 resources within the meaning of CEQA and adversely affect the resources within the meaning of
 35 Section 106 of the NHPA because this disturbance would impair the ability of these resources to
 36 yield data useful in research. These effects would be adverse.

37 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 38 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
 39 their integrity. For these reasons this effect would be adverse.

40 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
 41 resources that cannot be identified at this time because much of the footprint is not legally
 42 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
 43 archaeological research, as well as the integrity to convey this significance, they are likely to qualify

1 as historical resources or unique archaeological sites under CEQA or historic properties under the
 2 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
 3 these resources by disrupting the spatial associations that could yield important data, resulting in a
 4 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
 5 guarantee that all eligible or significant resources would be preserved in place, or that all important
 6 data would be retrieved before construction destroys these resources. The scale of the BDCP,
 7 investment into existing designs, and the presence of other important environmental resources such
 8 as habitat, natural communities, and wetlands that should be avoided are constraints on the
 9 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

10 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of**
 11 **Archaeological Resources**

12 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

13 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory**
 14 **Efforts**

15 Appendix 18A, *Archaeological Resources Sensitivity Assessment*, presents an overview of the
 16 sensitivity of the Plan Area for previously unidentified archaeological resources and demonstrates
 17 that additional prehistoric and historic-era sites that have not yet been identified are almost certain
 18 to occur in the portion of the Plan Area where this alternative would be constructed. This sensitivity
 19 and the potential impact mechanisms are substantially similar to the sensitivity and impact
 20 mechanism described for Alternative 1A. It should be noted however, that the eastern canal would
 21 cross more sensitive soil formations and result in continuous ground-disturbance than Alternative
 22 1A, which consists of a tunnel, and Alternative 1C which makes use of a tunnel for a portion of the
 23 conveyance alignment. This results in a slightly greater potential to affect prehistoric archaeological
 24 resources compared to Alternative 1A and 1C. Figure 1 in Appendix 18A depicts the eastern canal
 25 relative to archaeologically sensitive soil formations. The general sensitivity for historic-era
 26 archaeological resources is similar to Alternative 1A.

27 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 28 resources by disrupting the spatial associations that convey data useful in research or changing the
 29 setting such that the resource no longer contains its significance. These impacts would thus
 30 materially impair these resources within the meaning of CEQA and adversely affect the resources
 31 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
 32 these resources to yield data useful in research. These effects would be adverse.

33 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 34 sites that also may not necessarily be identified prior to construction. While cultural resource
 35 inventories will be completed once legal access is secured, no inventory can ensure that all
 36 resources are identified prior to construction. Because these sites may qualify for the NRHP or
 37 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
 38 adverse.

39 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
 40 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
 41 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
 42 disrupt the spatial associations that contain scientifically useful information it would alter the
 43 potential basis for eligibility, thus materially altering the resource and resulting in a significant

1 effect. Because these resources would not be identified prior to construction, they cannot be
 2 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
 3 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
 4 worker training, monitoring and discovery protocols. However, because archaeological resources
 5 may not be identified prior to disturbance through these measures, the effect cannot be entirely
 6 avoided. Therefore, this impact would remain significant and unavoidable.

7 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
 8 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

9 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

10 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

11 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
 12 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
 13 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
 14 Alternative 1A. However, because the eastern canal crosses more sensitive soil formations and may
 15 result in greater continuous ground disturbance than the tunnel option or the western canal, the
 16 potential for impacts on buried human remains may be slightly higher than described for these
 17 other options.

18 Ground-disturbing construction has the potential to damage and disinter buried human remains,
 19 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
 20 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
 21 remains adverse.

22 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 23 may occur either in isolation or as part of identified and previously unidentified archaeological
 24 resources where construction will occur. This effect would be adverse.

25 **CEQA Conclusion:** This impact would be significant. The Alternative 1B area is sensitive for buried
 26 human remains. Construction would likely result in disturbance of these features. Disturbance of
 27 human remains, including remains interred outside of cemeteries is considered a significant impact
 28 in the CEQA Appendix G checklist; therefore disturbance of these remains would result in a
 29 significant effect. Mitigation measures would reduce the severity of this impact, but not to a less-
 30 than-significant level because mitigation would not guarantee that these features could be
 31 discovered and treated in advance of construction; the scale of construction makes it technically and
 32 economically infeasible to perform the level of sampling necessary to identify all such resources
 33 prior to construction. Therefore, this impact is considered significant and unavoidable.

34 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 35 **Such Resources Are Discovered during Construction**

36 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

37 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic**
 38 **Architectural/Built-Environment Resources Resulting from Construction Activities**

39 Built-environment resources that may be affected by this alternative include resources identified
 40 and evaluated in inventory efforts conducted for other projects and resources identified in surveys

1 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
2 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
3 similar reasons some are considered historical resources under CEQA. As identified in Appendix
4 18B, Table 18B-3, a total of 24 built-environment resources have the potential to be directly or
5 indirectly affected by construction of this alternative. These resources are spatially distributed
6 across the alignment. The affected resources have been evaluated for the NRHP and CRHR. The basis
7 for the eligibility recommendations for each resource is provided in Appendix 18B, in Section B.1.2,
8 *Built Environment Resource Descriptions*.

9 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
10 built environment resources. These alterations may diminish the integrity of these resources. For
11 these reasons this effect would be adverse.

12 **Discussion of Anticipated Effects on Identified and Accessible Resources**

13 Direct effects would result from demolition of resources to construct features such as intakes, the
14 canal, and reusable tunnel material (RTM) areas. Indirect effects would result where resources
15 would remain, but the nearby setting would be altered by these same features. Modification of
16 resources may result in direct effects. The exact effect mechanism for each resource is described in
17 Appendix 18B, in Table 18B-3. Facility redesign to avoid direct impacts on historic architectural
18 resources is preferred as mitigation if possible. However, it is unlikely that all identified resources
19 can be avoided because of the scale of the BDCP and the need to balance avoidance of other
20 important environmental resources such as wetlands, natural communities, and special-status
21 species habitat. These effects would materially impair the resources within the meaning of CEQA
22 and result in adverse effects within the meaning of Section 106 because they would diminish the
23 characteristics that convey the significance of the resources. Some direct demolition and indirect
24 effects such as setting changes are likely to occur even with mitigation. Therefore, these effects
25 would be adverse.

26 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
27 in the footprint of this alternative (24 individual resources, as described in Appendix 18B, Table
28 18B-3). These resources have been evaluated for the CRHR and qualify as historical resources under
29 CEQA. Construction of conveyance facilities may require demolition of the historic built-
30 environment resources. Construction may also result in permanent indirect effects such as changes
31 to the setting. Direct demolition or changes to the setting would be material alterations because they
32 would either remove the resource or alter the resource character, resulting in an inability of the
33 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
34 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
35 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
36 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
37 even with implementation of the following mitigation measures.

38 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built** 39 **Environment Treatment Plan**

40 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

1 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic**
2 **Architectural/Built-Environment Resources Resulting from Construction Activities**

3 Because DWR does not have legal access to the majority of the footprint for this alternative,
4 inventory efforts in the entire footprint have not been completed. Nonetheless, the intensity of
5 activity in the Delta region during the historic era and a review of available data such as aerial
6 photographs suggest that numerous additional resources occur in the footprint that have not been
7 identified or which cannot currently be accessed and evaluated.

8 Review of available data such as aerial photographs, historic topographic maps, and assessors'
9 records indicate that many of these inaccessible properties are 45 years of age or older and have the
10 potential to be eligible historic resources.

11 Approximately 67 unevaluated built-environment resources have been identified in the footprint of
12 this alternative (ICF 2012, see tables of inaccessible properties and associated maps). Many of these
13 resources are likely to be significant because they may be associated with the important historical
14 themes described above in Section 18.1.6, *Historic-Era Setting*. In addition, such resources may be
15 associated with historically significant persons, or may represent significant artistic values. Thus the
16 resources may have significance under both CEQA (State CEQA Guidelines Section 15064.5[a][3])
17 and the NRHP (30 CFR 60.4). In addition, because many of the historic-era structures in the Delta
18 region are intact, and retain their rural agricultural setting, many of these resources are likely to
19 have integrity within the meaning of CEQA and the NRHP (14 CCR Section 4852[c], 30 CFR 60.4).
20 Because many unidentified resources are likely to have significance and integrity, they may qualify
21 as historical resources under CEQA and historic properties under Section 106 of the NHPA.

22 **Anticipated Effects**

23 Construction may result in direct demolition of these resources, damage through vibration, or
24 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
25 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
26 guarantee that eligible resources would be avoided and that adverse changes to the setting would
27 not occur. The scale of the BDCP and other design constraints, such as the presence of other
28 important environmental resources, makes avoidance of all direct and indirect effects unlikely.
29 Therefore, this effect would be adverse.

30 TCPs may also occur within the footprint of this alternative. These resources consist of built
31 environment features or activity areas that are important in the cultural life of a living community.
32 Examples of such resources include local gathering halls and Native American traditional activity
33 areas. Where these resources have both integrity of condition and integrity of relationship, and meet
34 the criteria for listing in the NRHP, they can qualify as historic properties (National Park Service
35 1998:11–12). Resources that are NRHP-eligible would also be historical resources under CEQA
36 (California PRC Section 5024.1[d][1]).

37 Construction has the potential to directly or indirectly damage built-environment resources through
38 demolition or introduction of new inconsistent features into the setting. These changes would
39 impair the ability of the resources to convey their significance because the character defining
40 elements or setting of the resource would be lost. Therefore, impacts on these resources may be
41 adverse.

1 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
 2 inaccessible and NRHP and CRHR-eligible resources. These changes may diminish the integrity of
 3 these resources. For these reasons, this effect would be adverse.

4 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
 5 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
 6 efforts have not gathered complete information in these inaccessible areas. Many of these resources
 7 are likely to be associated with important historical themes or persons, or possess high creative
 8 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
 9 these resources remain intact and retain their rural agricultural setting they are also likely to have
 10 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
 11 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
 12 demolition of the historic built-environment resources. Construction may also result in permanent
 13 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
 14 material alterations because they would either remove the resource or alter the resource character,
 15 resulting in an inability of the resource to convey its significance. For these reasons this would be a
 16 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
 17 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
 18 environmental resources make avoidance of all significant effects unlikely. For these reasons this
 19 impact remains significant and unavoidable even with implementation of the following mitigation
 20 measures.

21 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess**
 22 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and**
 23 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

24 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

25 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

26 This impact describes the potential effects of other conservation measures at a program level of
 27 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
 28 to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources,
 29 scope of activities, and geographic area of effects are generally similar. These measures would result
 30 in effects on cultural resources when ground-disturbing work is performed to construct
 31 improvements and enhance or restore natural communities. Direct effects would occur through
 32 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
 33 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment
 34 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
 35 manner that is inconsistent with the feeling and association of the resource. Because the ability of
 36 the resources to convey their significance would be lost this effect would materially alter these
 37 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural
 38 landscapes that are converted to habitat may no longer convey the themes of agriculture and
 39 settlement, and thus would be inconsistent with remaining features associated with rural historic
 40 landscapes created by reclamation, cultivation, and ranching.

41 Because of the large acreages of land included in all conservation measures that would be
 42 implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local

1 registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact
2 would be adverse. Mitigation Measure CUL-7 below addresses this effect.

3 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
4 introduction of new infrastructure to the Plan Area. These physical modifications may result in
5 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
6 integrity of these resources. For these reasons these effects would be adverse.

7 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
8 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
9 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
10 built-environment resources such as historic architectural structures and rural historic landscapes.
11 The same construction may damage unique archaeological sites. This construction would likely
12 result in materially adverse changes for the following reasons:

- 13 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
14 contain data useful in research, thus diminishing or destroying the basis for the significance of
15 the resource, and;
- 16 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
17 built-environment resources, resulting in an inability of the resource to convey its significance,
18 and;
- 19 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
20 resulting in an inability of the resource to convey its significance.
- 21 ● Ground-disturbing construction may inadvertently disturb human remains.

22 The alteration of a resource that changes the characteristics that convey its significance is a material
23 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
24 CEQA under the Appendix G checklist. Because this construction would materially alter these
25 categories of resources and disturb human remains it would result in a significant impact. Mitigation
26 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
27 where possible, and developing treatment where avoidance is not possible. In addition construction
28 would be monitored. However, because of the acreage associated with the proposed restoration
29 under conservation measures, as well as the multiple constraints associated with other
30 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
31 resources could be avoided. Therefore, this impact remains significant and unavoidable.

32 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
33 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
34 **Implementation of Conservation Measures 2–22**

35 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

36 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other**
37 **Conservation Measures with Plans and Policies**

38 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
39 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
40 resources of the Delta. A number of plans and policies that coincide with the study area provide
41 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local

1 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
 2 Alternative 1B is compatible or incompatible with these policies, rather than whether impacts are
 3 adverse or not adverse or significant or less than significant. Because Alternative 1B would result in
 4 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land
 5 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
 6 BDCP will be compatible with these policies because significant cultural resources will be avoided
 7 where feasible, and mitigation will be implemented to reduce effects where avoidance and
 8 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
 9 some instances because multiple constraints governing the location of proposed facilities makes
 10 preservation of all significant cultural resources unlikely. It should be noted that, as described in
 11 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
 12 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

13 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
 14 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

15 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
 16 the various counties with jurisdiction in this region. For policies that emphasize preservation or
 17 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
 18 agencies will implement cultural resource management practices that will identify significant
 19 resources, preserve such resources where feasible, and complete mitigation to reduce significant
 20 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
 21 incompatible in some instances because multiple constraints governing the location of proposed
 22 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
 23 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
 24 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
 25 environment.

26 **18.3.5.4 Alternative 1C—Dual Conveyance with West Alignment and Intakes** 27 **W1–W5 (15,000 cfs; Operational Scenario A)**

28 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of** 29 **Conveyance Facilities**

30 **Identified Resources**

31 Record searches at the CHRIS and inventory efforts for the BDCP have identified 12 previously
 32 recorded archaeological sites in the footprint of this alternative as described in Appendix 18B, Table
 33 18B-1 (only 11 are potentially register eligible). Detailed site descriptions summarizing available
 34 information regarding these resources, are provided in Appendix 18B, Section B.1.2 *Archaeological*
 35 *Site Descriptions*.

36 These sites are distributed more heavily towards the northern and southern end of the alignment
 37 where ground-disturbing effects of the western canal are concentrated.

38 **Significance of Identified Archaeological Resources**

39 Many of the directly affected sites are midden sites, with debris and artifacts associated with
 40 prehistoric habitation and residence activities. Midden sites in the Plan Area are often colloquially
 41 referred to as “mound sites” because they often form low mounds elevated relative to the

1 surrounding landform. While the original raised deposit has sometimes been destroyed, midden
2 sites often have substantial deposits below the original raised landform that remain intact that
3 typically contain the material remains associated with prehistoric habitation. This organic debris
4 can be used for radiocarbon dating, as well as material that reveals the nature of subsistence
5 activities pursued by prehistoric populations. Because there is no single unified prehistoric
6 chronology for the Delta region, substantial research questions remain unresolved regarding nature
7 and changes of subsistence and settlement activity over the span of the prehistoric occupation of the
8 Delta. The Delta is the prehistoric point of articulation between Central Valley cultures and the
9 aboriginal people that occupied the San Francisco Bay area. Because the cultural chronology and
10 sources of cultural change for the Delta remain unresolved in part, sites in the footprint of this
11 alternative likely contain information that could help clarify these research issues. For this reason
12 these resources are likely significant under the fourth criterion for the CRHR and NRHP.

13 Seven of the identified sites in the footprint of the western canal contain human burials, as described
14 on the site records. Most if not all of the remaining sites are likely to contain additional burials
15 because midden sites in the Plan Area typically contain human burials or cremations. Burial
16 components within these sites often contain ornaments and other personal items such as
17 charmstones, beads, and other decorative material. Because the style and form of these artifacts
18 change throughout prehistory, and because these stylistic changes have been defined, these
19 materials provide a method of associating archaeological material with specific prehistoric time
20 periods. The ability to associate habitation remains with specific time periods is one of the most
21 significant problems in prehistoric research, because the sequence of specific adaptations and
22 behaviors only becomes clear when a chronology can be constructed that associates behavior and
23 material culture with specific time frames. For this reason these resources are likely significant
24 under the fourth criterion for the CRHR and NRHP.

25 Because many of these prehistoric resources are large (typically in excess of 30 meters across), they
26 are each likely to contain some portion of the deposit with sufficient integrity to yield artifacts in
27 their original associations in a manner that will convey these significance themes. Therefore these
28 identified resources are likely to qualify as historical resources under CEQA. For the same reasons,
29 these resources are likely to qualify as historic properties under the NRHP.

30 One historic-era archaeological resource consists of the remains of pilings and rip-rap (CA-Yol-
31 165H). A site record update for CA-Yol-165H indicates that under a memorandum dated March 23,
32 2006 "with the California SHPO," the site is not considered a contributing element of the Sacramento
33 River levee system because it lacks integrity of design, setting, materials, workmanship, and feeling
34 (Bell 2006). For these reasons this site is not an historic property, nor is it likely to qualify as an
35 historical resource under CEQA.

36 **Anticipated Effects on Identified Resources**

37 The exact location of these resources cannot be disclosed because such disclosure might lead to
38 damage (CA Gov. Code Section 6254[r]). However these resources occur within the footprint of both
39 temporary work areas and permanent surface impacts. These sites are distributed more heavily
40 towards the northern and southern end of the alignment. Ground-disturbing construction is likely to
41 disturb the deposits and thus materially alter their ability to convey their significance. Much of the
42 data potential in archaeological resources exists in the spatial associations of different artifacts and
43 other cultural material. Where artifacts that have known associations with particular time periods
44 occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the

1 proximity of the materials allows an inference as to the age of the subsistence remains, thereby
 2 allowing researchers to infer particular subsistence strategies during different prehistoric periods.
 3 Intrusive ground-disturbing construction, vibration, and other physical disturbance may disrupt
 4 these associations and thus disrupt the qualities for which the sites may qualify as historical
 5 resources or historic properties. In addition, because not all identified resources are legally
 6 accessible, these resources may be significant for other reasons than their data potential. Indirect
 7 effects such as introduction of changes to the setting associated with construction of new features or
 8 creation of new sources of noise (also a change to the setting) may diminish the basis for the
 9 significance of these resources. For these reasons, construction has the potential to materially
 10 impair these resources under CEQA and to adversely affect the resources as defined by Section 106
 11 of the NHPA. This effect would be adverse.

12 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
 13 damage these resources. This damage may impair the integrity of these resources and thus reduce
 14 their ability to convey their significance. For these reasons this effect would be adverse.

15 **CEQA Conclusion:** Construction of conveyance facilities would affect identified 12 archaeological
 16 resources that occur in the footprint of this alternative. DWR identified these resources and finds
 17 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
 18 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
 19 potential to qualify as historical resources. Therefore, these sites are considered historic resources
 20 for the purposes of CEQA. This impact would be significant because construction could materially
 21 alter or destroy the potential of these resources to yield information useful in archaeological
 22 research, the basis for the significance of these resources, through excavation and disruption of the
 23 spatial associations that contain meaningful information. Identified but currently inaccessible
 24 resources may also be significant under other register criteria; indirect effects such as introduction
 25 of new inconsistent changes to the setting may also diminish the significance of these resources.
 26 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
 27 scientifically important material would be retrieved because feasible archaeological excavation only
 28 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
 29 important information. Construction could damage these remaining portions of the deposit.
 30 Therefore, this impact is significant and unavoidable.

31 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
 32 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
 33 **Archaeological Sites**

34 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

35 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory**
 36 **Efforts**

37 This impact is generally similar to Impact CUL-2 described under Alternative 1A. This alternative is
 38 sensitive for previously unidentified archaeological resources that are likely to be significant and to
 39 have integrity for the same reasons as described under Alternative 1A. It should be noted however,
 40 that the western canal would cross more sensitive soil formations along the northern and southern
 41 ends of the alignment compared to Alternative 1A. The middle segment of this alternative would
 42 make use of a subterranean tunnel that crosses low-sensitivity soil units. The overall sensitivity for
 43 prehistoric archaeological resources may be slightly higher than Alternative 1A because of the

1 relative proportion of high sensitivity geological formations, but the sensitivity for yet-unidentified
 2 resources may be slightly lower than the eastern canal (Alternative 1B). Figure 1 in Appendix 18A
 3 depicts the western canal relative to archaeologically sensitive soil formations. The general
 4 sensitivity for historic-era archaeological resources is similar to Alternative 1A.

5 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 6 resources by disrupting the spatial associations that convey data useful in research or changing the
 7 setting such that the resource no longer contains its significance. The location of ground-disturbing
 8 features such as intakes, the canal, tunnel segment, and borrow areas are depicted in Figure M3-3 in
 9 the mapbook volume. These impacts would thus materially impair these resources within the
 10 meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA
 11 because this disturbance would impair the ability of these resources to yield data useful in research.
 12 While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be
 13 avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects
 14 would remain adverse.

15 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 16 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
 17 their integrity. For these reasons this effect would be adverse.

18 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
 19 resources that cannot be identified at this time because much of the footprint is not legally
 20 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
 21 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
 22 as historical resources or unique archaeological sites under CEQA or historic properties under the
 23 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
 24 these resources by disrupting the spatial associations that could yield important data, resulting in a
 25 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
 26 guarantee that all eligible or significant resources would be preserved in place, or that all important
 27 data would be retrieved before construction destroys these resources. The scale of the BDCP,
 28 investment into existing designs, and the presence of other important environmental resources such
 29 as habitat, natural communities, and wetlands that should be avoided are constraints on the
 30 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

31 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of** 32 **Archaeological Resources**

33 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

34 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory** 35 **Efforts**

36 Appendix 18A, *Archaeological Resources Sensitivity Assessment*, presents an overview of the
 37 sensitivity of the Plan Area for previously unidentified archaeological resources and demonstrates
 38 that additional prehistoric and historic-era sites that have not yet been identified are almost certain
 39 to occur in the portion of the Plan Area where this alternative would be constructed. This sensitivity
 40 and the potential impact mechanisms are substantially similar to the sensitivity and impact
 41 mechanism described for Alternative 1A. It should be noted however, that the western canal would
 42 cross more sensitive soil formations along the northern and southern ends of the alignment
 43 compared to Alternative 1A. The portion of the alignment that would cross archaeologically

1 sensitive soil units is slightly lower than the eastern canal. The middle segment of this alternative
2 would make use of a subterranean tunnel that crosses low-sensitivity soil units. Figure 1 in
3 Appendix 18A depicts the western canal relative to archaeologically sensitive soil formations. The
4 general sensitivity for historic-era archaeological resources is similar to Alternative 1A and 1B.

5 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
6 resources by disrupting the spatial associations that convey data useful in research or changing the
7 setting such that the resource no longer contains its significance. These impacts would thus
8 materially impair these resources within the meaning of CEQA and adversely affect the resources
9 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
10 these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these
11 effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of
12 some resources is inevitable given the scale of the proposed construction. These effects would
13 therefore remain adverse.

14 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
15 sites that also may not necessarily be identified prior to construction. While cultural resource
16 inventories will be completed once legal access is secured, no inventory can ensure that all
17 resources are identified prior to construction. Because these sites may qualify for the NRHP or
18 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
19 adverse.

20 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
21 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
22 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
23 disrupt the spatial associations that contain scientifically useful information it would alter the
24 potential basis for eligibility, thus materially altering the resource and resulting in a significant
25 effect. Because these resources would not be identified prior to construction, they cannot be
26 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
27 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
28 worker training, monitoring and discovery protocols. However, because archaeological resources
29 may not be identified prior to disturbance through these measures, the effect cannot be entirely
30 avoided. Therefore, this impact would remain significant and unavoidable.

31 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
32 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

33 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

34 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

35 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
36 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
37 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
38 Alternative 1A. However, because the western canal crosses more sensitive soil formations and may
39 result in greater continuous ground disturbance than 1A, the potential for impacts on buried human
40 remains may be slightly higher than described for Alternative 1A, but this sensitivity is not as high
41 as the eastern canal because soil units this alignment crosses may be slightly less sensitive as
42 depicted in Appendix 18.

1 Ground-disturbing construction has the potential to damage and disinter buried human remains,
 2 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
 3 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
 4 remains adverse.

5 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 6 may occur either in isolation or as part of identified and previously unidentified archaeological
 7 resources where construction will occur. This effect would be adverse.

8 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
 9 remains. Construction would likely result in disturbance of these features. Disturbance of human
 10 remains, including remains interred outside of cemeteries is considered a significant impact in the
 11 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
 12 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
 13 significant level because mitigation would not guarantee that these features could be discovered and
 14 treated in advance of construction; the scale of construction makes it technically and economically
 15 infeasible to perform the level of sampling necessary to identify all such resources prior to
 16 construction. Therefore, this impact is considered significant and unavoidable.

17 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 18 **Such Resources Are Discovered during Construction**

19 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

20 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic**
 21 **Architectural/Built-Environment Resources Resulting from Construction Activities**

22 Built-environment resources that may be affected by this alternative include resources identified
 23 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
 24 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 25 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 26 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 27 18B, Table 18B-4, a total of 22 built-environment resources have the potential to be directly or
 28 indirectly affected by construction of this alternative. The specific nature and location of the impact
 29 mechanism for each affected resource is also described in Table 18B-4. The affected resources have
 30 been evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each
 31 resource is provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

32 **Discussion of Anticipated Effects on Identified and Accessible Resources**

33 Construction of canal, intakes, borrow areas, and other features such as temporary work areas will
 34 result in direct and indirect effects on built-environment resources. The exact effect mechanism for
 35 each resource is described in Appendix 18B, in Table 18B-4. Facility redesign to avoid direct impacts
 36 on historic architectural resources is preferred as mitigation if possible. However, it is unlikely that
 37 all identified resources can be avoided because of the scale of the BDCP and the need to balance
 38 avoidance of other important environmental resources such as wetlands, natural communities, and
 39 special-status species habitat. These effects would materially impair the resources within the
 40 meaning of CEQA and result in adverse effects within the meaning of Section 106 because they
 41 would diminish the characteristics that convey the significance of the resources. Some direct

1 demolition and indirect effects such as setting changes are likely to occur even with mitigation.
2 Therefore, these effects would be adverse.

3 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
4 built environment resources. These alterations may diminish the integrity of these resources. For
5 these reasons this effect would be adverse.

6 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
7 in the footprint of this alternative (22 individual resources, as described in Appendix 18B, Table
8 18B-4). These resources have been evaluated for the CRHR and qualify as historical resources under
9 CEQA. Construction of conveyance facilities may require demolition of the historic built-
10 environment resources. Construction may also result in permanent indirect effects such as changes
11 to the setting. Direct demolition or changes to the setting would be material alterations because they
12 would either remove the resource or alter the resource character, resulting in an inability of the
13 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
14 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
15 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
16 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
17 even with implementation of the following mitigation measures.

18 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built**
19 **Environment Treatment Plan**

20 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

21 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic**
22 **Architectural/Built-Environment Resources Resulting from Construction Activities**

23 Because DWR does not have legal access to the majority of the footprint for this alternative,
24 inventory efforts in the entire footprint have not been completed. Nonetheless, the intensity of
25 activity in the Delta region during the historic era and a review of available data such as aerial
26 photographs suggest that numerous additional resources occur in the footprint that have not been
27 identified or which cannot currently be accessed and evaluated.

28 Review of available data such as aerial photographs, historic topographic maps, and assessors'
29 records indicate that many of these inaccessible properties are 45 years of age or older and have the
30 potential to be eligible historic resources. Approximately 74 unevaluated built-environment
31 resources have been identified in the footprint of this alternative (ICF 2012, see tables of
32 inaccessible properties and associated maps). Many of these resources are likely to be significant
33 because they may be associated with the important historical themes described above in Section
34 18.1.6, *Historic-Era Setting*. In addition, such resources may be associated with historically
35 significant persons, or may represent significant artistic values. Thus the resources may have
36 significance under both CEQA, and the NRHP. In addition, because many of the historic-era
37 structures in the Delta region are intact, and retain their rural agricultural setting, many of these
38 resources are likely to have integrity within the meaning of CEQA and the NRHP. Because many
39 unidentified resources are likely to have significance and integrity, they may qualify as historical
40 resources under CEQA and historic properties under Section 106 of the NHPA.

1 Anticipated Effects

2 Construction may result in direct demolition of these resources, damage through vibration, or
 3 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
 4 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
 5 guarantee that eligible resources would be avoided and that adverse changes to the setting would
 6 not occur. The scale of the BDCP and other design constraints, such as the presence of other
 7 important environmental resources, makes avoidance of all direct and indirect effects unlikely.
 8 Therefore, this effect would be adverse.

9 TCPs may also occur within the footprint of this alternative. These resources consist of built
 10 environment features or activity areas that are important in the cultural life of a living community.
 11 Examples of such resources include local gathering halls and Native American traditional activity
 12 areas. Where these resources have both integrity of condition and integrity of relationship, and meet
 13 the criteria for listing in the NRHP, they can qualify as historic properties (National Park Service
 14 1998:11–12). Resources that are NRHP-eligible would also be historical resources under CEQA
 15 (California PRC Section 5024.1[d][1])

16 Construction has the potential to directly or indirectly damage built-environment resources through
 17 demolition or introduction of new inconsistent features into the setting. These changes would
 18 impair the ability of the resources to convey their significance because the character defining
 19 elements or setting of the resource would be lost. Therefore, impacts on these resources may be
 20 adverse.

21 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
 22 inaccessible and NRHP and CRHR-eligible built environment resources. These changes may diminish
 23 the integrity of these resources. For these reasons, this effect would be adverse.

24 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
 25 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
 26 efforts have not gathered complete information in these inaccessible areas. Many of these resources
 27 are likely to be associated with important historical themes or persons, or possess high creative
 28 values; therefore, they are likely to have significance under CEQA and the NHPA. Construction of
 29 conveyance facilities may require demolition of the historic built-environment resources.
 30 Construction may also result in permanent indirect effects such as changes to the setting. Direct
 31 demolition or changes to the setting would be material alterations because they would either
 32 remove the resource or alter the resource character, resulting in an inability of the resource to
 33 convey its significance. For these reasons this would be a significant effect. Mitigation described
 34 below may reduce these effects, but cannot guarantee they would be entirely avoided. The scale of
 35 the BDCP and the constraints imposed by other environmental resources make avoidance of all
 36 significant effects unlikely. For these reasons this impact remains significant and unavoidable even
 37 with implementation of the following mitigation measures.

38 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess** 39 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and** 40 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

41 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

1 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

2 This impact describes the potential effects of other conservation measures at a program level of
 3 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
 4 to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources,
 5 scope of activities, and geographic area of effects are generally similar. These measures would result
 6 in effects on cultural resources when ground-disturbing work is performed to construct
 7 improvements and enhance or restore natural communities. Direct effects would occur through
 8 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
 9 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment
 10 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
 11 manner that is inconsistent with the feeling and association of the resource. Because the ability of
 12 the resources to convey their significance would be lost this effect would materially alter these
 13 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural
 14 landscapes that are converted to habitat may no longer convey the themes of agriculture and
 15 settlement, and thus would be inconsistent with remaining features associated with rural historic
 16 landscapes created by reclamation, cultivation, and ranching.

17 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
 18 land included in all conservation measures that would be implemented under this alternative, it is
 19 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
 20 archaeological sites could be avoided. Therefore, this impact would be adverse.

21 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
 22 introduction of new infrastructure to the Plan Area. These physical modifications may result in
 23 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
 24 integrity of these resources. For these reasons these effects would be adverse.

25 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
 26 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
 27 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
 28 built-environment resources such as historic architectural structures and rural historic landscapes.
 29 The same construction may damage unique archaeological sites. This construction would likely
 30 result in materially adverse changes for the following reasons:

- 31 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
 32 contain data useful in research, thus diminishing or destroying the basis for the significance of
 33 the resource, and;
- 34 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
 35 built-environment resources, resulting in an inability of the resource to convey its significance,
 36 and;
- 37 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
 38 resulting in an inability of the resource to convey its significance.
- 39 ● Ground-disturbing construction may inadvertently disturb human remains.

40 The alteration of a resource that changes the characteristics that convey its significance is a material
 41 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
 42 CEQA under the Appendix G checklist. Because this construction would materially alter these
 43 categories of resources and disturb human remains it would result in a significant impact. Mitigation

1 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
 2 where possible, and developing treatment where avoidance is not possible. In addition construction
 3 would be monitored. However, because of the acreage associated with the proposed restoration
 4 under conservation measures, as well as the multiple constraints associated with other
 5 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
 6 resources could be avoided. Therefore, this impact remains significant and unavoidable.

7 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
 8 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
 9 **Implementation of Conservation Measures 2–22**

10 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

11 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other**
 12 **Conservation Measures with Plans and Policies**

13 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
 14 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
 15 resources of the Delta. A number of plans and policies that coincide with the study area provide
 16 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
 17 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
 18 Alternative 1C is compatible or incompatible with these policies, rather than whether impacts are
 19 adverse or not adverse or significant or less than significant. Because Alternative 1C would result in
 20 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land
 21 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
 22 BDCP will be compatible with these policies because significant cultural resources will be avoided
 23 where feasible, and mitigation will be implemented to reduce effects where avoidance and
 24 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
 25 some instances because multiple constraints governing the location of proposed facilities makes
 26 preservation of all significant cultural resources unlikely. It should be noted that, as described in
 27 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
 28 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

29 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
 30 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

31 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
 32 the various counties with jurisdiction in this region. For policies that emphasize preservation or
 33 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
 34 agencies will implement cultural resource management practices that will identify significant
 35 resources, preserve such resources where feasible, and complete mitigation to reduce significant
 36 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
 37 incompatible in some instances because multiple constraints governing the location of proposed
 38 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
 39 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
 40 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
 41 environment.

18.3.5.5 Alternative 2A—Dual Conveyance with Pipeline/Tunnel and Five Intakes (15,000 cfs; Operational Scenario B)

Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of Conveyance Facilities

Identified Resources

Record searches at the CHRIS and inventory efforts for the BDCP have identified six previously recorded archaeological sites in the footprint of this alternative (Appendix 18B, Table 18B-1). Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*. These six previously recorded resources represent the known resources that occur in the footprint of this alternative. The resources are distributed evenly across the alignment, but are somewhat clustered where construction of large above-ground features would occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern end of the alignment.

Significance of Identified Archaeological Resources

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

Anticipated Effects on Identified Resources

Ground-disturbing construction is likely to disturb the deposits and thus materially alter their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction, vibration, and other physical disturbance may disrupt these associations and thus disrupt the qualities for which the sites qualify as historical resources. In addition, because not all identified resources are legally accessible, these resources may be significant for other reasons than their data potential. Indirect effects such as introduction of changes to the setting associated with construction of new features or creation of new sources of noise (also a change to the setting) may diminish the basis for the significance of these resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

NEPA Effects: Construction may disturb NRHP and CRHR-eligible archaeological resources and damage these resources. This damage may impair the integrity of these resources and thus reduce their ability to convey their significance. For these reasons this effect would be adverse.

CEQA Conclusion: Construction of conveyance facilities would affect six identified archaeological resources that occur in the footprint of this alternative. DWR identified these resources and finds that they are likely to qualify as historical resources under CEQA (see the individual site descriptions in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the potential to qualify as historical resources. Therefore, these sites are considered historic resources for the purposes of CEQA. This impact would be significant because construction could materially

1 alter or destroy the potential of these resources to yield information useful in archaeological
 2 research, the basis for the significance of these resources, through excavation and disruption of the
 3 spatial associations that contain meaningful information. Identified but currently inaccessible
 4 resources may also be significant under other register criteria; indirect effects such as introduction
 5 of new inconsistent changes to the setting may also diminish the significance of these resources.
 6 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
 7 scientifically important material would be retrieved because feasible archaeological excavation only
 8 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
 9 important information. Construction could damage these remaining portions of the deposit.
 10 Therefore, this impact is significant and unavoidable.

11 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
 12 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
 13 **Archaeological Sites**

14 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

15 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory**
 16 **Efforts**

17 This impact is substantially similar to Impact CUL-2 described under Alternative 1A. While the
 18 intake locations would vary, the number of intakes is the same, and thus the overall potential for
 19 effects on archaeological resources is similar.

20 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 21 resources by disrupting the spatial associations that convey data useful in research or changing the
 22 setting such that the resource no longer contains its significance. These impacts would thus
 23 materially impair these resources within the meaning of CEQA and adversely affect the resources
 24 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
 25 these resources to yield data useful in research. While Mitigation Measure CUL-2 would reduce
 26 these effects, it cannot guarantee all effects would be avoided because relocation of proposed
 27 facilities to avoid all resources is unlikely. These effects would remain adverse.

28 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 29 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
 30 their integrity. For these reasons this effect would be adverse.

31 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
 32 resources that cannot be identified at this time because much of the footprint is not legally
 33 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
 34 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
 35 as historical resources or unique archaeological sites under CEQA or historic properties under the
 36 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
 37 these resources by disrupting the spatial associations that could yield important data, resulting in a
 38 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
 39 guarantee that all eligible or significant resources would be preserved in place, or that all important
 40 data would be retrieved before construction destroys these resources. The scale of the BDCP,
 41 investment into existing designs, and the presence of other important environmental resources such
 42 as habitat, natural communities, and wetlands that should be avoided are constraints on the
 43 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

1 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of**
 2 **Archaeological Resources**

3 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

4 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory**
 5 **Efforts**

6 This impact is substantially similar to Impact CUL-3 described under Alternative 1A. While the
 7 intake locations would vary, the number of intakes is the same, and thus the overall potential for
 8 effects on archaeological resources is similar.

9 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 10 resources by disrupting the spatial associations that convey data useful in research or changing the
 11 setting such that the resource no longer contains its significance. These impacts would thus
 12 materially impair these resources within the meaning of CEQA and adversely affect the resources
 13 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
 14 these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these
 15 effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of
 16 some resources is inevitable given the scale of the proposed construction. These effects would
 17 therefore remain adverse.

18 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
 19 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
 20 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
 21 disrupt the spatial associations that contain scientifically useful information it would alter the
 22 potential basis for eligibility, thus materially altering the resource and resulting in a significant
 23 effect. Because these resources would not be identified prior to construction, they cannot be
 24 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
 25 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
 26 worker training, monitoring and discovery protocols. However, because archaeological resources
 27 may not be identified prior to disturbance through these measures, the effect cannot be entirely
 28 avoided. Therefore, this impact would remain significant and unavoidable.

29 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
 30 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

31 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

32 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

33 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
 34 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
 35 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
 36 Alternative 1A. While the intake locations would vary, the number of intakes is the same, and thus
 37 the overall potential for effects on buried human remains is similar.

38 Ground-disturbing construction has the potential to damage and disinter buried human remains,
 39 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
 40 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
 41 remains adverse.

1 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 2 may occur either in isolation or as part of identified and previously unidentified archaeological
 3 resources where construction will occur. This effect would be adverse.

4 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
 5 remains. Construction would likely result in disturbance of these features. Disturbance of human
 6 remains, including remains interred outside of cemeteries is considered a significant impact in the
 7 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
 8 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
 9 significant level because mitigation would not guarantee that these features could be discovered and
 10 treated in advance of construction; the scale of construction makes it technically and economically
 11 infeasible to perform the level of sampling necessary to identify all such resources prior to
 12 construction. Therefore, this impact is considered significant and unavoidable.

13 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 14 **Such Resources Are Discovered during Construction**

15 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

16 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic**
 17 **Architectural/Built-Environment Resources Resulting from Construction Activities**

18 Built-environment resources that may be affected by this alternative include resources identified
 19 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
 20 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 21 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 22 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 23 18B, Table 18B-5, a total of 24 built-environment resources have the potential to be directly or
 24 indirectly affected by construction of this alternative. The specific nature and location of the impact
 25 mechanism for each affected resource is also described in Table 18B-5. The affected resources have
 26 been evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each
 27 resource is provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

28 **Discussion of Anticipated Effects on Identified and Accessible Resources**

29 Construction of intakes, transmission lines, temporary work areas and other features will result in
 30 direct and indirect effects on identified and eligible built-environment resources. The exact effect
 31 mechanism for each resource is described in Appendix 18B, in Table 18B-5. Facility redesign to
 32 avoid direct impacts on historic architectural resources is preferred as mitigation if possible.
 33 However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP
 34 and the need to balance avoidance of other important environmental resources such as wetlands,
 35 natural communities, and special-status species habitat. These effects would materially impair the
 36 resources within the meaning of CEQA and result in adverse effects within the meaning of Section
 37 106 because they would diminish the characteristics that convey the significance of the resources.
 38 Some direct demolition and indirect effects such as setting changes are likely to occur even with
 39 mitigation. Therefore, these effects would be adverse.

40 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
 41 built environment resources. These alterations may diminish the integrity of these resources. For
 42 these reasons this effect would be adverse.

1 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
2 in the footprint of this alternative (24 individual resources, as described in Appendix 18B, Table
3 18B-5). These resources have been evaluated for the CRHR and qualify as historical resources under
4 CEQA. Construction of conveyance facilities may require demolition of the historic built-
5 environment resources. Construction may also result in permanent indirect effects such as changes
6 to the setting. Direct demolition or changes to the setting would be material alterations because they
7 would either remove the resource or alter the resource character, resulting in an inability of the
8 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
9 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
10 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
11 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
12 even with implementation of the following mitigation measures.

13 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and Implement a Built** 14 **Environment Treatment Plan**

15 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

16 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic** 17 **Architectural/Built-Environment Resources Resulting from Construction Activities**

18 The footprint of this alternative is sensitive for unidentified and unevaluated built-environment
19 resources that may have significance and integrity for the same reasons described under Alternative
20 1A. Approximately 71 unevaluated built-environment resources have been identified that may be
21 subject to direct or indirect effects as a result of the construction of this alternative (ICF 2012, see
22 tables of inaccessible properties and associated maps).

23 **Anticipated Effects**

24 Construction may result in direct demolition of these resources, damage through vibration, or
25 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
26 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
27 guarantee that eligible resources would be avoided and that adverse changes to the setting would
28 not occur. Construction has the potential to directly or indirectly damage built-environment
29 resources through demolition or introduction of new inconsistent features into the setting. These
30 changes would impair the ability of the resources to convey their significance because the character
31 defining elements or setting of the resource would be lost. Therefore, impacts on these resources
32 may be adverse.

33 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
34 inaccessible and NRHP and CRHR-eligible built environment resources. These changes may diminish
35 the integrity of these resources. For these reasons, this effect would be adverse.

36 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
37 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
38 efforts have not gathered complete information in these inaccessible areas. Many of these resources
39 are likely to be associated with important historical themes or persons, or possess high creative
40 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
41 these resources remain intact and retain their rural agricultural setting they are also likely to have
42 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or

1 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
 2 demolition of the historic built-environment resources. Construction may also result in permanent
 3 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
 4 material alterations because they would either remove the resource or alter the resource character,
 5 resulting in an inability of the resource to convey its significance. For these reasons this would be a
 6 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
 7 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
 8 environmental resources make avoidance of all significant effects unlikely. For these reasons this
 9 impact remains significant and unavoidable even with implementation of the following mitigation
 10 measures.

11 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess**
 12 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and**
 13 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

14 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

15 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

16 This impact describes the potential effects of other conservation measures at a program level of
 17 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
 18 to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources,
 19 scope of activities, and geographic area of effects are generally similar. These measures would result
 20 in effects on cultural resources when ground-disturbing work is performed to construct
 21 improvements and enhance or restore natural communities. Direct effects would occur through
 22 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
 23 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment
 24 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
 25 manner that is inconsistent with the feeling and association of the resource. Because the ability of
 26 the resources to convey their significance would be lost this effect would materially alter these
 27 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural
 28 landscapes that are converted to habitat may no longer convey the themes of agriculture and
 29 settlement, and thus would be inconsistent with remaining features associated with rural historic
 30 landscapes created by reclamation, cultivation, and ranching.

31 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
 32 land included in all conservation measures that would be implemented under this alternative, it is
 33 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
 34 archaeological sites could be avoided. Therefore, this impact would be adverse.

35 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
 36 introduction of new infrastructure to the Plan Area. These physical modifications may result in
 37 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
 38 integrity of these resources. For these reasons these effects would be adverse.

39 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
 40 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
 41 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
 42 built-environment resources such as historic architectural structures and rural historic landscapes.

1 The same construction may damage unique archaeological sites. This construction would likely
2 result in materially adverse changes for the following reasons.

- 3 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
4 contain data useful in research, thus diminishing or destroying the basis for the significance of
5 the resource.
- 6 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
7 built-environment resources, resulting in an inability of the resource to convey its significance.
- 8 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
9 resulting in an inability of the resource to convey its significance.
- 10 ● Ground-disturbing construction may inadvertently disturb human remains.

11 The alteration of a resource that changes the characteristics that convey its significance is a material
12 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
13 CEQA under the Appendix G checklist. Because this construction would materially alter these
14 categories of resources and disturb human remains it would result in a significant impact. Mitigation
15 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
16 where possible, and developing treatment where avoidance is not possible. In addition construction
17 would be monitored. However, because of the acreage associated with the proposed restoration
18 under conservation measures, as well as the multiple constraints associated with other
19 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
20 resources could be avoided. Therefore, this impact remains significant and unavoidable.

21 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
22 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
23 **Implementation of Conservation Measures 2–22**

24 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

25 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other**
26 **Conservation Measures with Plans and Policies**

27 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
28 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
29 resources of the Delta. A number of plans and policies that coincide with the study area provide
30 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
31 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
32 Alternative 2A is compatible or incompatible with these policies, rather than whether impacts are
33 adverse or not adverse or significant or less than significant. Because Alternative 2A would result in
34 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land
35 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
36 BDCP will be compatible with these policies because significant cultural resources will be avoided
37 where feasible, and mitigation will be implemented to reduce effects where avoidance and
38 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
39 some instances because multiple constraints governing the location of proposed facilities makes
40 preservation of all significant cultural resources unlikely. It should be noted that, as described in
41 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
42 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

1 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
2 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

3 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
4 the various counties with jurisdiction in this region. For policies that emphasize preservation or
5 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
6 agencies will implement cultural resource management practices that will identify significant
7 resources, preserve such resources where feasible, and complete mitigation to reduce significant
8 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
9 incompatible in some instances because multiple constraints governing the location of proposed
10 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
11 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
12 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
13 environment.

14 **18.3.5.6 Alternative 2B—Dual Conveyance with East Alignment and Five** 15 **Intakes (15,000 cfs; Operational Scenario B)**

16 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of** 17 **Conveyance Facilities**

18 **Identified Resources**

19 Record searches at the CHRIS and inventory efforts for the BDCP have identified 16 previously
20 recorded prehistoric archaeological sites in the footprint of this alternative (Table 18B-1). Detailed
21 site descriptions summarizing available information regarding these resources, are provided in
22 Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*. These sites are distributed more
23 heavily towards the northern and southern end of the alignment. A total of six of these sites have
24 documented human remains, however most of the sites are likely to contain human remains because
25 midden sites and identified artifacts are typically associated with burials.

26 **Significance of Identified Archaeological Resources**

27 The resources affected by this alternative have likely have significance and integrity within the
28 meaning of the NRHP and CRHR for the same reasons described above under Alternative 1B.

29 **Anticipated Effects on Identified Resources**

30 Ground-disturbing construction is likely to disturb the deposits and thus materially alter their
31 ability to convey their significance. Much of the data potential in archaeological resources exists in
32 the spatial associations of different artifacts and other cultural material. Where artifacts that have
33 known associations with particular time periods occur adjacent to other material such as faunal
34 bone or plant remains from subsistence activity, the proximity of the materials allows an inference
35 as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence
36 strategies during different prehistoric periods. Intrusive ground-disturbing construction, vibration,
37 and other physical disturbance may disrupt these associations and thus disrupt the qualities for
38 which the sites may qualify as historical resources or historic properties. In addition, because not all
39 identified resources are legally accessible, these resources may be significant for other reasons than
40 their data potential. Indirect effects such as introduction of changes to the setting associated with
41 construction of new features or creation of new sources of noise (also a change to the setting) may

1 diminish the basis for the significance of these resources. For these reasons, construction has the
 2 potential to materially impair these resources under CEQA and to adversely affect the resources as
 3 defined by Section 106 of the NHPA. This effect would be adverse.

4 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
 5 damage these resources. This damage may impair the integrity of these resources and thus reduce
 6 their ability to convey their significance. For these reasons this effect would be adverse.

7 **CEQA Conclusion:** Construction of conveyance facilities would affect identified 16 archaeological
 8 resources that occur in the footprint of this alternative. DWR identified these resources and finds
 9 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
 10 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
 11 potential to qualify as historical resources. Therefore, these sites are considered historic resources
 12 for the purposes of CEQA. This impact would be significant because construction could materially
 13 alter or destroy the potential of these resources to yield information useful in archaeological
 14 research, the basis for the significance of these resources, through excavation and disruption of the
 15 spatial associations that contain meaningful information. Identified but currently inaccessible
 16 resources may also be significant under other register criteria; indirect effects such as introduction
 17 of new inconsistent changes to the setting may also diminish the significance of these resources.
 18 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
 19 scientifically important material would be retrieved because feasible archaeological excavation only
 20 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
 21 important information. Construction could damage these remaining portions of the deposit.
 22 Therefore, this impact is significant and unavoidable.

23 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
 24 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
 25 **Archaeological Sites**

26 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

27 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory**
 28 **Efforts**

29 This impact is generally similar to Impact CUL-2 described under Alternative 1B. This alternative is
 30 sensitive for previously unidentified archaeological resources that are likely to be significant and to
 31 have integrity for the same reasons as described under Alternative 1B. It should be noted however,
 32 that the eastern canal would cross more sensitive soil formations than the tunnel option and result
 33 in continuous ground-disturbance that may have a slightly greater potential to affect prehistoric
 34 archaeological resources compared to Alternative 1A and Alternative 1C. Figure 1 in Appendix 18A
 35 depicts the eastern canal relative to archaeologically sensitive soil formations. The general
 36 sensitivity for historic-era archaeological resources is similar to Alternative 1A.

37 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 38 resources by disrupting the spatial associations that convey data useful in research or changing the
 39 setting such that the resource no longer contains its significance. These impacts would thus
 40 materially impair these resources within the meaning of CEQA and adversely affect the resources
 41 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
 42 these resources to yield data useful in research. The locations of ground-disturbing features such as
 43 the canal, access roads, pumping plants, borrow areas and concrete batch plants are depicted in

1 Figure M3-2 in the mapbook volume. While Mitigation Measure CUL-2 would reduce these effects, it
 2 cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all
 3 resources is unlikely. These effects would remain adverse.

4 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 5 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
 6 their integrity. For these reasons this effect would be adverse.

7 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
 8 resources that cannot be identified at this time because much of the footprint is not legally
 9 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
 10 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
 11 as historical resources or unique archaeological sites under CEQA or historic properties under the
 12 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
 13 these resources by disrupting the spatial associations that could yield important data, resulting in a
 14 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
 15 guarantee that all eligible or significant resources would be preserved in place, or that all important
 16 data would be retrieved before construction destroys these resources. The scale of the BDCP,
 17 investment into existing designs, and the presence of other important environmental resources such
 18 as habitat, natural communities, and wetlands that should be avoided are constraints on the
 19 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

20 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of**
 21 **Archaeological Resources**

22 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

23 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory**
 24 **Efforts**

25 Appendix 18A, *Archaeological Resources Sensitivity Assessment*, presents an overview of the
 26 sensitivity of the Plan Area for previously unidentified archaeological resources and demonstrates
 27 that additional prehistoric and historic-era sites that have not yet been identified are almost certain
 28 to occur in the portion of the Plan Area where this alternative would be constructed. This sensitivity
 29 and the potential impact mechanisms are substantially similar to the sensitivity and impact
 30 mechanism described for Alternative 1B. It should be noted however, that the eastern canal would
 31 cross more sensitive soil formations and result in continuous ground-disturbance that may have a
 32 slightly greater potential to affect prehistoric archaeological resources compared to Alternative 1A
 33 and Alternative 1C. Figure 1 in Appendix 18A depicts the eastern canal relative to archaeologically
 34 sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar
 35 to Alternative 1A.

36 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 37 resources by disrupting the spatial associations that convey data useful in research or changing the
 38 setting such that the resource no longer contains its significance. These impacts would thus
 39 materially impair these resources within the meaning of CEQA and adversely affect the resources
 40 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
 41 these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these
 42 effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of

1 some resources is inevitable given the scale of the proposed construction. These effects would
2 therefore remain adverse.

3 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
4 sites that also may not necessarily be identified prior to construction. While cultural resource
5 inventories will be completed once legal access is secured, no inventory can ensure that all
6 resources are identified prior to construction. Because these sites may qualify for the NRHP or
7 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
8 adverse.

9 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
10 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
11 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
12 disrupt the spatial associations that contain scientifically useful information it would alter the
13 potential basis for eligibility, thus materially altering the resource and resulting in a significant
14 effect. Because these resources would not be identified prior to construction, they cannot be
15 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
16 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
17 worker training, monitoring and discovery protocols. However, because archaeological resources
18 may not be identified prior to disturbance through these measures, the effect cannot be entirely
19 avoided. Therefore, this impact would remain significant and unavoidable.

20 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
21 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

22 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

23 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

24 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
25 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
26 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
27 Alternative 1B. However, because the eastern canal crosses more sensitive soil formations and may
28 result in greater continuous ground disturbance than 1A and 1C, the potential for impacts on buried
29 human remains may be slightly higher than described for Alternative 1A.

30 Ground-disturbing construction has the potential to damage and disinter buried human remains,
31 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
32 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
33 remains adverse.

34 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
35 may occur either in isolation or as part of identified and previously unidentified archaeological
36 resources where construction will occur. This effect would be adverse.

37 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
38 remains. Construction would likely result in disturbance of these features. Disturbance of human
39 remains, including remains interred outside of cemeteries is considered a significant impact in the
40 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
41 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
42 significant level because mitigation would not guarantee that these features could be discovered and

1 treated in advance of construction; the scale of construction makes it technically and economically
 2 infeasible to perform the level of sampling necessary to identify all such resources prior to
 3 construction. Therefore, this impact is considered significant and unavoidable.

4 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 5 **Such Resources Are Discovered during Construction**

6 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

7 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic**
 8 **Architectural/Built-Environment Resources Resulting from Construction Activities**

9 Built-environment resources that may be affected by this alternative include resources identified
 10 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
 11 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 12 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 13 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 14 18B, Table 18B-6, a total of 25 built-environment resources have the potential to be directly or
 15 indirectly affected by construction of this alternative. The specific nature and location of the impact
 16 mechanism for each affected resource is also described in Table 18B-6. The affected resources have
 17 been evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each
 18 resource is provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

19 **Discussion of Anticipated Effects on Identified and Accessible Resources**

20 Construction of the canal, intakes, RTM areas, and other temporary and permanent features would
 21 result in direct and indirect effects. The exact effect mechanism for each resource is described in
 22 Appendix 18B, in Table 18B-6. Facility redesign to avoid direct impacts on historic architectural
 23 resources is preferred as mitigation if possible. However, it is unlikely that all identified resources
 24 can be avoided because of the scale of the BDCP and the need to balance avoidance of other
 25 important environmental resources such as wetlands, natural communities, and special-status
 26 species habitat. These effects would materially impair the resources within the meaning of CEQA
 27 and result in adverse effects within the meaning of Section 106 because they would diminish the
 28 characteristics that convey the significance of the resources. Some direct demolition and indirect
 29 effects such as setting changes are likely to occur even with mitigation. Therefore, these effects
 30 would be adverse.

31 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
 32 built environment resources. These alterations may diminish the integrity of these resources. For
 33 these reasons this effect would be adverse.

34 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
 35 in the footprint of this alternative (25 individual resources, as described in Appendix 18B, Table
 36 18B-6). These resources have been evaluated for the CRHR and qualify as historical resources under
 37 CEQA. Construction of conveyance facilities may require demolition of the historic built-
 38 environment resources. Construction may also result in permanent indirect effects such as changes
 39 to the setting. Direct demolition or changes to the setting would be material alterations because they
 40 would either remove the resource or alter the resource character, resulting in an inability of the
 41 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
 42 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The

1 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
 2 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
 3 even with implementation of the following mitigation measures.

4 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and Implement a Built**
 5 **Environment Treatment Plan**

6 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

7 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic**
 8 **Architectural/Built-Environment Resources Resulting from Construction Activities**

9 The footprint of this alternative is sensitive for unidentified and unevaluated built-environment
 10 resources that may have significance and integrity for the same reasons described under Alternative
 11 1B. Approximately 67 unevaluated built-environment resources have been identified that may be
 12 subject to direct or indirect effects as a result of the construction of this alternative (ICF 2012, see
 13 tables of inaccessible properties and associated maps).

14 **Anticipated Effects**

15 Construction may result in direct demolition of these resources, damage through vibration, or
 16 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
 17 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
 18 guarantee that eligible resources would be avoided and that adverse changes to the setting would
 19 not occur. Construction has the potential to directly or indirectly damage built-environment
 20 resources through demolition or introduction of new inconsistent features into the setting. These
 21 changes would impair the ability of the resources to convey their significance because the character
 22 defining elements or setting of the resource would be lost. Therefore, impacts on these resources
 23 may be adverse.

24 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
 25 inaccessible and NRHP and CRHR-eligible resources. These changes may diminish the integrity of
 26 these resources. For these reasons, this effect would be adverse.

27 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
 28 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
 29 efforts have not gathered complete information in these inaccessible areas. Many of these resources
 30 are likely to be associated with important historical themes or persons, or possess high creative
 31 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
 32 these resources remain intact and retain their rural agricultural setting they are also likely to have
 33 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
 34 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
 35 demolition of the historic built-environment resources. Construction may also result in permanent
 36 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
 37 material alterations because they would either remove the resource or alter the resource character,
 38 resulting in an inability of the resource to convey its significance. For these reasons this would be a
 39 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
 40 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
 41 environmental resources make avoidance of all significant effects unlikely. For these reasons this

1 impact remains significant and unavoidable even with implementation of the following mitigation
2 measures.

3 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess**
4 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and**
5 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

6 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

7 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

8 This impact describes the potential effects of other conservation measures at a program level of
9 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
10 to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources,
11 scope of activities, and geographic area of effects are generally similar. These measures would result
12 in effects on cultural resources when ground-disturbing work is performed to construct
13 improvements and enhance or restore natural communities. Direct effects would occur through
14 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
15 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment
16 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
17 manner that is inconsistent with the feeling and association of the resource. Because the ability of
18 the resources to convey their significance would be lost this effect would materially alter these
19 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural
20 landscapes that are converted to habitat may no longer convey the themes of agriculture and
21 settlement, and thus would be inconsistent with remaining features associated with rural historic
22 landscapes created by reclamation, cultivation, and ranching.

23 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
24 land included in all conservation measures that would be implemented under this alternative, it is
25 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
26 archaeological sites could be avoided. Therefore, this impact would be adverse.

27 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
28 introduction of new infrastructure to the Plan Area. These physical modifications may result in
29 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
30 integrity of these resources. For these reasons these effects would be adverse.

31 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
32 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
33 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
34 built-environment resources such as historic architectural structures and rural historic landscapes.
35 The same construction may damage unique archaeological sites. This construction would likely
36 result in materially adverse changes for the following reasons.

- 37 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
38 contain data useful in research, thus diminishing or destroying the basis for the significance of
39 the resource.
- 40 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
41 built-environment resources, resulting in an inability of the resource to convey its significance.

- 1 • Ground-disturbing construction may either directly demolish or change the setting of TCPs
- 2 resulting in an inability of the resource to convey its significance.
- 3 • Ground-disturbing construction may inadvertently disturb human remains.

4 The alteration of a resource that changes the characteristics that convey its significance is a material
 5 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
 6 CEQA under the Appendix G checklist. Because this construction would materially alter these
 7 categories of resources and disturb human remains it would result in a significant impact. Mitigation
 8 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
 9 where possible, and developing treatment where avoidance is not possible. In addition construction
 10 would be monitored. However, because of the acreage associated with the proposed restoration
 11 under conservation measures, as well as the multiple constraints associated with other
 12 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
 13 resources could be avoided. Therefore, this impact remains significant and unavoidable.

14 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
 15 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
 16 **Implementation of Conservation Measures 2–22**

17 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

18 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other**
 19 **Conservation Measures with Plans and Policies**

20 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
 21 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
 22 resources of the Delta. A number of plans and policies that coincide with the study area provide
 23 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
 24 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
 25 Alternative 2B is compatible or incompatible with these policies, rather than whether impacts are
 26 adverse or not adverse or significant or less than significant. Because Alternative 2B would result in
 27 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land
 28 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
 29 BDCP will be compatible with these policies because significant cultural resources will be avoided
 30 where feasible, and mitigation will be implemented to reduce effects where avoidance and
 31 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
 32 some instances because multiple constraints governing the location of proposed facilities makes
 33 preservation of all significant cultural resources unlikely. It should be noted that, as described in
 34 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
 35 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

36 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
 37 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

38 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
 39 the various counties with jurisdiction in this region. For policies that emphasize preservation or
 40 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
 41 agencies will implement cultural resource management practices that will identify significant
 42 resources, preserve such resources where feasible, and complete mitigation to reduce significant

1 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
 2 incompatible in some instances because multiple constraints governing the location of proposed
 3 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
 4 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
 5 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
 6 environment.

7 **18.3.5.7 Alternative 2C—Dual Conveyance with West Alignment and Intakes** 8 **W1-W5 (15,000 cfs; Operational Scenario B)**

9 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of** 10 **Conveyance Facilities**

11 **Identified Resources**

12 Record searches at the CHRIS and inventory efforts for the BDCP have identified 12 previously
 13 recorded archaeological sites in the footprint of this alternative as described in Appendix 18B, Table
 14 18B-1 (only 11 are potentially register eligible). Detailed site descriptions summarizing available
 15 information regarding these resources, are provided in Appendix 18B, Section B.1.2 *Archaeological*
 16 *Site Descriptions*.

17 These sites are distributed more heavily towards the northern and southern end of the alignment
 18 where ground-disturbing effects of the western canal are concentrated.

19 **Significance of Identified Archaeological Resources**

20 The resources affected by this alternative have likely have significance and integrity within the
 21 meaning of the NRHP and CRHR for the same reasons described above under Alternative 1C. CA-Yol-
 22 165H does not have sufficient integrity to convey significance and therefore does not qualify as an
 23 historical resource or historic property. Seven of these sites have documented human remains;
 24 additional human remains are likely to be contained in the other sites based on the nature of the
 25 associated deposits (midden, ornaments typically used as grave goods).

26 **Anticipated Effects on Identified Resources**

27 Ground-disturbing construction is likely to disturb the deposits and thus materially alter their
 28 ability to convey their significance. Much of the data potential in archaeological resources exists in
 29 the spatial associations of different artifacts and other cultural material. Where artifacts that have
 30 known associations with particular time periods occur adjacent to other material such as faunal
 31 bone or plant remains from subsistence activity, the proximity of the materials allows an inference
 32 as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence
 33 strategies during different prehistoric periods. Intrusive ground-disturbing construction, vibration,
 34 and other physical disturbance may disrupt these associations and thus disrupt the qualities for
 35 which the sites may qualify as historical resources or historic properties. In addition, because not all
 36 identified resources are legally accessible, these resources may be significant for other reasons than
 37 their data potential. Indirect effects such as introduction of changes to the setting associated with
 38 construction of new features or creation of new sources of noise (also a change to the setting) may
 39 diminish the basis for the significance of these resources. For these reasons, construction has the
 40 potential to materially impair these resources under CEQA and to adversely affect the resources as
 41 defined by Section 106 of the NHPA. This effect would be adverse.

1 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
 2 damage these resources. This damage may impair the integrity of these resources and thus reduce
 3 their ability to convey their significance. For these reasons this effect would be adverse.

4 **CEQA Conclusion:** Construction of conveyance facilities would affect 12 identified archaeological
 5 resources that occur in the footprint of this alternative. DWR identified these resources and finds
 6 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
 7 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
 8 potential to qualify as historical resources. Therefore, these sites are considered historic resources
 9 for the purposes of CEQA. This impact would be significant because construction could materially
 10 alter or destroy the potential of these resources to yield information useful in archaeological
 11 research, the basis for the significance of these resources, through excavation and disruption of the
 12 spatial associations that contain meaningful information. Identified but currently inaccessible
 13 resources may also be significant under other register criteria; indirect effects such as introduction
 14 of new inconsistent changes to the setting may also diminish the significance of these resources.
 15 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
 16 scientifically important material would be retrieved because feasible archaeological excavation only
 17 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
 18 important information. Construction could damage these remaining portions of the deposit.
 19 Therefore, this impact is significant and unavoidable.

20 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
 21 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
 22 **Archaeological Sites**

23 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

24 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory**
 25 **Efforts**

26 This impact is generally similar to Impact CUL-2 described under Alternative 1C. This alternative is
 27 sensitive for previously unidentified archaeological resources that are likely to be significant and to
 28 have integrity for the same reasons as described under Alternative 1C. It should be noted however,
 29 that the western canal would cross more sensitive soil formations along the northern and southern
 30 ends of the alignment compared to Alternative 1A. The middle segment of this alternative would
 31 make use of a subterranean tunnel that crosses low-sensitivity soil units. The overall sensitivity for
 32 prehistoric archaeological resources may be slightly higher than Alternative 1A because of the
 33 relative proportion of high sensitivity geological formations. The overall sensitivity for the western
 34 canal may be less than for eastern canal alternatives because the concentration of sensitivity
 35 geological formations is higher for the eastern canal. Figure 1 in Appendix 18A depicts the western
 36 canal relative to archaeologically sensitive soil formations. The general sensitivity for historic-era
 37 archaeological resources is similar to Alternative 1A.

38 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 39 resources by disrupting the spatial associations that convey data useful in research or changing the
 40 setting such that the resource no longer contains its significance. The location of ground-disturbing
 41 features such as intakes, the canal, tunnel segment, and borrow areas are depicted in Figure M3-3 in
 42 the mapbook volume. These impacts would thus materially impair these resources within the
 43 meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA

1 because this disturbance would impair the ability of these resources to yield data useful in research.
 2 While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be
 3 avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects
 4 would remain adverse.

5 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 6 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
 7 their integrity. For these reasons this effect would be adverse.

8 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
 9 resources that cannot be identified at this time because much of the footprint is not legally
 10 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
 11 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
 12 as historical resources or unique archaeological sites under CEQA or historic properties under the
 13 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
 14 these resources by disrupting the spatial associations that could yield important data, resulting in a
 15 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
 16 guarantee that all eligible or significant resources would be preserved in place, or that all important
 17 data would be retrieved before construction destroys these resources. The scale of the BDCP,
 18 investment into existing designs, and the presence of other important environmental resources such
 19 as habitat, natural communities, and wetlands that should be avoided are constraints on the
 20 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

21 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of** 22 **Archaeological Resources**

23 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

24 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory** 25 **Efforts**

26 Appendix 18A, *Archaeological Resources Sensitivity Assessment*, presents an overview of the
 27 sensitivity of the Plan Area for previously unidentified archaeological resources and demonstrates
 28 that additional prehistoric and historic-era sites that have not yet been identified are almost certain
 29 to occur in the portion of the Plan Area where this alternative would be constructed. This sensitivity
 30 and the potential impact mechanisms are substantially similar to the sensitivity and impact
 31 mechanism described for Alternative 1C. It should be noted however, that the western canal would
 32 cross more sensitive soil formations along the northern and southern ends of the alignment
 33 compared to Alternative 1A. The middle segment of this alternative would make use of a
 34 subterranean tunnel that crosses low-sensitivity soil units. The overall sensitivity for prehistoric
 35 archaeological resources may be slightly higher than Alternative 1A because of the relative
 36 proportion of high sensitivity geological formations. The overall sensitivity may be lower relative to
 37 the eastern canal options. Figure 1 in Appendix 18A depicts the western canal relative to
 38 archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological
 39 resources is similar to Alternative 1A.

40 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 41 resources by disrupting the spatial associations that convey data useful in research or changing the
 42 setting such that the resource no longer contains its significance. These impacts would thus
 43 materially impair these resources within the meaning of CEQA and adversely affect the resources

1 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
 2 these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these
 3 effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of
 4 some resources is inevitable given the scale of the proposed construction. These effects would
 5 therefore remain adverse.

6 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 7 sites that also may not necessarily be identified prior to construction. While cultural resource
 8 inventories will be completed once legal access is secured, no inventory can ensure that all
 9 resources are identified prior to construction. Because these sites may qualify for the NRHP or
 10 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
 11 adverse.

12 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
 13 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
 14 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
 15 disrupt the spatial associations that contain scientifically useful information it would alter the
 16 potential basis for eligibility, thus materially altering the resource and resulting in a significant
 17 effect. Because these resources would not be identified prior to construction, they cannot be
 18 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
 19 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
 20 worker training, monitoring and discovery protocols. However, because archaeological resources
 21 may not be identified prior to disturbance through these measures, the effect cannot be entirely
 22 avoided. Therefore, this impact would remain significant and unavoidable.

23 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
 24 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

25 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

26 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

27 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
 28 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
 29 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
 30 Alternative 1A. However, because the western canal crosses more sensitive soil formations and may
 31 result in greater continuous ground disturbance than 1A, the potential for impacts on buried human
 32 remains may be slightly higher than described for Alternative 1A. Because the western canal crosses
 33 slightly lower sensitivity soil formations it may be slightly less sensitive for buried human remains
 34 relative to eastern canal options. Figure 1 in Appendix 18 depicts geological map units relative to the
 35 alignments.

36 Ground-disturbing construction has the potential to damage and disinter buried human remains,
 37 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
 38 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
 39 remains adverse.

40 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 41 may occur either in isolation or as part of identified and previously unidentified archaeological
 42 resources where construction will occur. This effect would be adverse.

1 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
 2 remains. Construction would likely result in disturbance of these features. Disturbance of human
 3 remains, including remains interred outside of cemeteries is considered a significant impact in the
 4 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
 5 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
 6 significant level because mitigation would not guarantee that these features could be discovered and
 7 treated in advance of construction; the scale of construction makes it technically and economically
 8 infeasible to perform the level of sampling necessary to identify all such resources prior to
 9 construction. Therefore, this impact is considered significant and unavoidable.

10 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 11 **Such Resources Are Discovered during Construction**

12 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

13 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic**
 14 **Architectural/Built-Environment Resources Resulting from Construction Activities**

15 Built-environment resources that may be affected by this alternative include resources identified
 16 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
 17 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 18 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 19 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 20 18B, Table 18B-7, a total of 22 built-environment resources have the potential to be directly or
 21 indirectly affected by construction of this alternative. The specific nature and location of the impact
 22 mechanism for each affected resource is also described in Table 18B-7. The affected resources have
 23 been evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each
 24 resource is provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

25 **Discussion of Anticipated Effects on Identified and Accessible Resources**

26 Construction of the canal, intakes, and borrow and spoil areas will result in direct and indirect
 27 effects. The exact effect mechanism for each resource is described in Appendix 18B, in Table 18B-7.
 28 Facility redesign to avoid direct impacts on historic architectural resources is preferred as
 29 mitigation if possible. However, it is unlikely that all identified resources can be avoided because of
 30 the scale of the BDCP and the need to balance avoidance of other important environmental
 31 resources such as wetlands, natural communities, and special-status species habitat. These effects
 32 would materially impair the resources within the meaning of CEQA and result in adverse effects
 33 within the meaning of Section 106 because they would diminish the characteristics that convey the
 34 significance of the resources. Some direct demolition and indirect effects such as setting changes are
 35 likely to occur even with mitigation. Therefore, these effects would be adverse.

36 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
 37 built environment resources. These alterations may diminish the integrity of these resources. For
 38 these reasons this effect would be adverse.

39 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
 40 in the footprint of this alternative (22 individual resources, as described in Appendix 18B, Table
 41 18B-7). These resources have been evaluated for the CRHR and qualify as historical resources under
 42 CEQA. Construction of conveyance facilities may require demolition of the historic built-

1 environment resources. Construction may also result in permanent indirect effects such as changes
 2 to the setting. Direct demolition or changes to the setting would be material alterations because they
 3 would either remove the resource or alter the resource character, resulting in an inability of the
 4 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
 5 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
 6 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
 7 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
 8 even with implementation of the following mitigation measures.

9 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built**
 10 **Environment Treatment Plan**

11 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

12 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic**
 13 **Architectural/Built-Environment Resources Resulting from Construction Activities**

14 The footprint of this alternative is sensitive for unidentified and unevaluated built-environment
 15 resources that may have significance and integrity for the same reasons described under Alternative
 16 1C. Approximately 74 unevaluated built-environment resources have been identified that may be
 17 subject to direct or indirect effects as a result of the construction of this alternative (ICF 2012, see
 18 tables of inaccessible properties and associated maps).

19 **Anticipated Effects**

20 Construction may result in direct demolition of these resources, damage through vibration, or
 21 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
 22 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
 23 guarantee that eligible resources would be avoided and that adverse changes to the setting would
 24 not occur. Construction has the potential to directly or indirectly damage built-environment
 25 resources through demolition or introduction of new inconsistent features into the setting. These
 26 changes would impair the ability of the resources to convey their significance because the character
 27 defining elements or setting of the resource would be lost. Therefore, impacts on these resources
 28 may be adverse.

29 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
 30 inaccessible and NRHP and CRHR-eligible built environment resources. These changes may diminish
 31 the integrity of these resources. For these reasons, this effect would be adverse.

32 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
 33 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
 34 efforts have not gathered complete information in these inaccessible areas. Many of these resources
 35 are likely to be associated with important historical themes or persons, or possess high creative
 36 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
 37 these resources remain intact and retain their rural agricultural setting they are also likely to have
 38 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
 39 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
 40 demolition of the historic built-environment resources. Construction may also result in permanent
 41 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
 42 material alterations because they would either remove the resource or alter the resource character,

1 resulting in an inability of the resource to convey its significance. For these reasons this would be a
 2 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
 3 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
 4 environmental resources make avoidance of all significant effects unlikely. For these reasons this
 5 impact remains significant and unavoidable even with implementation of the following mitigation
 6 measures.

7 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess**
 8 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and**
 9 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

10 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

11 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

12 This impact describes the potential effects of other conservation measures at a program level of
 13 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
 14 to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources,
 15 scope of activities, and geographic area of effects are generally similar. These measures would result
 16 in effects on cultural resources when ground-disturbing work is performed to construct
 17 improvements and enhance or restore natural communities. Direct effects would occur through
 18 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
 19 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment
 20 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
 21 manner that is inconsistent with the feeling and association of the resource. Because the ability of
 22 the resources to convey their significance would be lost this effect would materially alter these
 23 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural
 24 landscapes that are converted to habitat may no longer convey the themes of agriculture and
 25 settlement, and thus would be inconsistent with remaining features associated with rural historic
 26 landscapes created by reclamation, cultivation, and ranching.

27 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
 28 land included in all conservation measures that would be implemented under this alternative, it is
 29 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
 30 archaeological sites could be avoided. Therefore, this impact would be adverse.

31 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
 32 introduction of new infrastructure to the Plan Area. These physical modifications may result in
 33 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
 34 integrity of these resources. For these reasons these effects would be adverse.

35 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
 36 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
 37 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
 38 built-environment resources such as historic architectural structures and rural historic landscapes.
 39 The same construction may damage unique archaeological sites. This construction would likely
 40 result in materially adverse changes for the following reasons.

- 1 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
- 2 contain data useful in research, thus diminishing or destroying the basis for the significance of
- 3 the resource.
- 4 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
- 5 built-environment resources, resulting in an inability of the resource to convey its significance.
- 6 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
- 7 resulting in an inability of the resource to convey its significance.
- 8 ● Ground-disturbing construction may inadvertently disturb human remains.

9 The alteration of a resource that changes the characteristics that convey its significance is a material
 10 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
 11 CEQA under the Appendix G checklist. Because this construction would materially alter these
 12 categories of resources and disturb human remains it would result in a significant impact. Mitigation
 13 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
 14 where possible, and developing treatment where avoidance is not possible. In addition construction
 15 would be monitored. However, because of the acreage associated with the proposed restoration
 16 under conservation measures, as well as the multiple constraints associated with other
 17 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
 18 resources could be avoided. Therefore, this impact remains significant and unavoidable.

19 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
 20 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
 21 **Implementation of Conservation Measures 2–22**

22 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

23 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other**
 24 **Conservation Measures with Plans and Policies**

25 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
 26 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
 27 resources of the Delta. A number of plans and policies that coincide with the study area provide
 28 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
 29 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
 30 Alternative 2C is compatible or incompatible with these policies, rather than whether impacts are
 31 adverse or not adverse or significant or less than significant. Because Alternative 2C would result in
 32 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land
 33 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
 34 BDCP will be compatible with these policies because significant cultural resources will be avoided
 35 where feasible, and mitigation will be implemented to reduce effects where avoidance and
 36 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
 37 some instances because multiple constraints governing the location of proposed facilities makes
 38 preservation of all significant cultural resources unlikely. It should be noted that, as described in
 39 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
 40 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

41 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
 42 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

1 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
 2 the various counties with jurisdiction in this region. For policies that emphasize preservation or
 3 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
 4 agencies will implement cultural resource management practices that will identify significant
 5 resources, preserve such resources where feasible, and complete mitigation to reduce significant
 6 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
 7 incompatible in some instances because multiple constraints governing the location of proposed
 8 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
 9 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
 10 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
 11 environment.

12 **18.3.5.8 Alternative 3—Dual Conveyance with Pipeline/Tunnel and Intakes 1** 13 **and 2 (6,000 cfs; Operational Scenario A)**

14 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of** 15 **Conveyance Facilities**

16 **Identified Resources**

17 Record searches at the CHRIS and inventory efforts for the BDCP have identified six previously
 18 recorded prehistoric archaeological sites in the footprint of this alternative (Appendix 18B, Table
 19 18B-1). Detailed site descriptions summarizing available information regarding these resources, are
 20 provided in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*. These six previously
 21 recorded resources represent the known resources that occur in the footprint of this alternative.
 22 The resources are distributed evenly across the alignment, but are somewhat clustered where
 23 construction of large above-ground features would occur, such as the northern end of the alignment,
 24 at the intermediate forebay, and at the southern end of the alignment. Two of these sites have
 25 documented human remains; however additional sites are likely to contain human remains because
 26 burials are typically associated with midden sites.

27 **Significance of Identified Archaeological Resources**

28 The resources affected by this alternative have likely have significance and integrity within the
 29 meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

30 **Anticipated Effects on Identified Resources**

31 Ground-disturbing construction is likely to disturb the deposits and thus materially alter their
 32 ability to convey their significance. Much of the data potential in archaeological resources exists in
 33 the spatial associations of different artifacts and other cultural material. Where artifacts that have
 34 known associations with particular time periods occur adjacent to other material such as faunal
 35 bone or plant remains from subsistence activity, the proximity of the materials allows an inference
 36 as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence
 37 strategies during different prehistoric periods. Intrusive ground-disturbing construction may
 38 disrupt these associations and thus disrupt the qualities for which the sites qualify as historical
 39 resources. In addition, because not all identified resources are legally accessible, these resources
 40 may be significant for other reasons than their data potential. Indirect effects such as introduction of
 41 changes to the setting associated with construction of new features or creation of new sources of

1 noise (also a change to the setting) may diminish the basis for the significance of these resources.
2 For these reasons, construction has the potential to materially impair these resources under CEQA
3 and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be
4 adverse.

5 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
6 damage these resources. This damage may impair the integrity of these resources and thus reduce
7 their ability to convey their significance. For these reasons this effect would be adverse.

8 **CEQA Conclusion:** Construction of conveyance facilities would affect identified archaeological
9 resources that occur in the footprint of this alternative. DWR identified these resources and finds
10 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
11 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
12 potential to qualify as historical resources. Therefore, these sites are considered historic resources
13 for the purposes of CEQA. This impact would be significant because construction could materially
14 alter or destroy the potential of these resources to yield information useful in archaeological
15 research, the basis for the significance of these resources, through excavation and disruption of the
16 spatial associations that contain meaningful information. Identified but currently inaccessible
17 resources may also be significant under other register criteria; indirect effects such as introduction
18 of new inconsistent changes to the setting may also diminish the significance of these resources.
19 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
20 scientifically important material would be retrieved because feasible archaeological excavation only
21 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
22 important information. Construction could damage these remaining portions of the deposit.
23 Therefore, this impact is significant and unavoidable.

24 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
25 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
26 **Archaeological Sites**

27 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

28 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory**
29 **Efforts**

30 This impact is substantially similar to Impact CUL-2 described under Alternative 1A. While the
31 number of intakes would be reduced, slightly reducing the footprint the overall potential for effects
32 on archaeological resources is similar.

33 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
34 resources by disrupting the spatial associations that convey data useful in research or changing the
35 setting such that the resource no longer contains its significance. These impacts would thus
36 materially impair these resources within the meaning of CEQA and adversely affect the resources
37 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
38 these resources to yield data useful in research. While Mitigation Measure CUL-2 would reduce
39 these effects, it cannot guarantee all effects would be avoided because relocation of proposed
40 facilities to avoid all resources is unlikely. The locations of various features such as intakes, forebays,
41 and tunnels shaft locations are depicted in Figure M3-1 in the mapbook volume. These effects would
42 remain adverse.

1 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
2 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
3 their integrity. For these reasons this effect would be adverse.

4 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
5 resources that cannot be identified at this time because much of the footprint is not legally
6 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
7 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
8 as historical resources or unique archaeological sites under CEQA or historic properties under the
9 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
10 these resources by disrupting the spatial associations that could yield important data, resulting in a
11 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
12 guarantee that all eligible or significant resources would be preserved in place, or that all important
13 data would be retrieved before construction destroys these resources. The scale of the BDCP,
14 investment into existing designs, and the presence of other important environmental resources such
15 as habitat, natural communities, and wetlands that should be avoided are constraints on the
16 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

17 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of** 18 **Archaeological Resources**

19 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

20 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory** 21 **Efforts**

22 This impact is substantially similar to Impact CUL-3 described under Alternative 1A. While the
23 number of intakes would be reduced, slightly reducing the footprint the overall potential for effects
24 on archaeological resources is similar.

25 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
26 resources by disrupting the spatial associations that convey data useful in research or changing the
27 setting such that the resource no longer contains its significance. These impacts would thus
28 materially impair these resources within the meaning of CEQA and adversely affect the resources
29 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
30 these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these
31 effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of
32 some resources is inevitable given the scale of the proposed construction. These effects would
33 therefore remain adverse.

34 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
35 sites that also may not necessarily be identified prior to construction. While cultural resource
36 inventories will be completed once legal access is secured, no inventory can ensure that all
37 resources are identified prior to construction. Because these sites may qualify for the NRHP or
38 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
39 adverse.

40 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
41 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
42 unique archaeological resources. Because direct excavation, compaction, or other disturbance may

1 disrupt the spatial associations that contain scientifically useful information it would alter the
 2 potential basis for eligibility, thus materially altering the resource and resulting in a significant
 3 effect. Because these resources would not be identified prior to construction, they cannot be
 4 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
 5 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
 6 worker training, monitoring and discovery protocols. However, because archaeological resources
 7 may not be identified prior to disturbance through these measures, the effect cannot be entirely
 8 avoided. Therefore, this impact would remain significant and unavoidable.

9 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
 10 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

11 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

12 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

13 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
 14 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
 15 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
 16 Alternative 1A. While the number of intakes would be reduced, slightly reducing the footprint the
 17 overall potential for effects on buried human resources is similar.

18 Ground-disturbing construction has the potential to damage and disinter buried human remains,
 19 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
 20 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
 21 remains adverse.

22 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 23 may occur either in isolation or as part of identified and previously unidentified archaeological
 24 resources where construction will occur. This effect would be adverse.

25 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
 26 remains. Construction would likely result in disturbance of these features. Disturbance of human
 27 remains, including remains interred outside of cemeteries is considered a significant impact in the
 28 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
 29 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
 30 significant level because mitigation would not guarantee that these features could be discovered and
 31 treated in advance of construction; the scale of construction makes it technically and economically
 32 infeasible to perform the level of sampling necessary to identify all such resources prior to
 33 construction. Therefore, this impact is considered significant and unavoidable.

34 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 35 **Such Resources Are Discovered during Construction**

36 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

37 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic**
 38 **Architectural/Built-Environment Resources Resulting from Construction Activities**

39 Built-environment resources that may be affected by this alternative include resources identified
 40 and evaluated in inventory efforts conducted for other projects and resources identified in surveys

1 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 2 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 3 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 4 18B, Table 18B-8, a total of 20 built-environment resources have the potential to be directly or
 5 indirectly affected by construction of this alternative. The specific nature and location of the impact
 6 mechanism for each affected resource is also described in Table 18B-8. The affected resources have
 7 been evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each
 8 resource is provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

9 **Discussion of Anticipated Effects on Identified and Accessible Resources**

10 Intakes, transmission lines, and other features would result in direct and indirect impacts. The exact
 11 effect mechanism for each resource is described in Appendix 18B, in Table 18B-8. Facility redesign
 12 to avoid direct impacts on historic architectural resources is preferred as mitigation if possible.
 13 However, it is unlikely that all identified resources can be avoided because of the scale of the BDCP
 14 and the need to balance avoidance of other important environmental resources such as wetlands,
 15 natural communities, and special-status species habitat. These effects would materially impair the
 16 resources within the meaning of CEQA and result in adverse effects within the meaning of Section
 17 106 because they would diminish the characteristics that convey the significance of the resources.
 18 Some direct demolition and indirect effects such as setting changes are likely to occur even with
 19 mitigation. Therefore, these effects would be adverse.

20 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
 21 built environment resources. These alterations may diminish the integrity of these resources. For
 22 these reasons this effect would be adverse.

23 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
 24 in the footprint of this alternative (20 individual resources, as described in Appendix 18B, Table
 25 18B-8). Construction of conveyance facilities may require demolition of the historic built-
 26 environment resources. These resources have been evaluated for the CRHR and qualify as historical
 27 resources under CEQA. Construction may also result in permanent indirect effects such as changes
 28 to the setting. Direct demolition or changes to the setting would be material alterations because they
 29 would either remove the resource or alter the resource character, resulting in an inability of the
 30 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
 31 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
 32 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
 33 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
 34 even with implementation of the following mitigation measures.

35 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built** 36 **Environment Treatment Plan**

37 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

38 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic** 39 **Architectural/Built-Environment Resources Resulting from Construction Activities**

40 The footprint of this alternative is sensitive for unidentified and unevaluated built-environment
 41 resources that may have significance and integrity for the same reasons described under Alternative
 42 1A. Approximately 71 unevaluated built-environment resources have been identified that may be

1 subject to direct or indirect effects as a result of the construction of this alternative (ICF 2012, see
2 tables of inaccessible properties and associated maps).

3 **Anticipated Effects**

4 Construction may result in direct demolition of these resources, damage through vibration, or
5 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
6 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
7 guarantee that eligible resources would be avoided and that adverse changes to the setting would
8 not occur. Construction has the potential to directly or indirectly damage built-environment
9 resources through demolition or introduction of new inconsistent features into the setting. These
10 changes would impair the ability of the resources to convey their significance because the character
11 defining elements or setting of the resource would be lost. Therefore, impacts on these resources
12 may be adverse.

13 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
14 inaccessible and NRHP and CRHR-eligible built environment resources. These changes may diminish
15 the integrity of these resources. For these reasons, this effect would be adverse.

16 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
17 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
18 efforts have not gathered complete information in these inaccessible areas. Many of these resources
19 are likely to be associated with important historical themes or persons, or possess high creative
20 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
21 these resources remain intact and retain their rural agricultural setting they are also likely to have
22 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
23 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
24 demolition of the historic built-environment resources. Construction may also result in permanent
25 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
26 material alterations because they would either remove the resource or alter the resource character,
27 resulting in an inability of the resource to convey its significance. For these reasons this would be a
28 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
29 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
30 environmental resources make avoidance of all significant effects unlikely. For these reasons this
31 impact remains significant and unavoidable even with implementation of the following mitigation
32 measures.

33 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess** 34 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and** 35 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

36 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

37 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

38 This impact describes the potential effects of other conservation measures at a program level of
39 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
40 to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources,
41 scope of activities, and geographic area of effects are generally similar. These measures would result
42 in effects on cultural resources when ground-disturbing work is performed to construct

1 improvements and enhance or restore natural communities. Direct effects would occur through
 2 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
 3 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment
 4 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
 5 manner that is inconsistent with the feeling and association of the resource. Because the ability of
 6 the resources to convey their significance would be lost this effect would materially alter these
 7 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural
 8 landscapes that are converted to habitat may no longer convey the themes of agriculture and
 9 settlement, and thus would be inconsistent with remaining features associated with rural historic
 10 landscapes created by reclamation, cultivation, and ranching.

11 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
 12 land included in all conservation measures that would be implemented under this alternative, it is
 13 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
 14 archaeological sites could be avoided. Therefore, this impact would be adverse.

15 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
 16 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
 17 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
 18 built-environment resources such as historic architectural structures and rural historic landscapes.
 19 The same construction may damage unique archaeological sites. This construction would likely
 20 result in materially adverse changes for the following reasons.

- 21 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
 22 contain data useful in research, thus diminishing or destroying the basis for the significance of
 23 the resource.
- 24 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
 25 built-environment resources, resulting in an inability of the resource to convey its significance.
- 26 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
 27 resulting in an inability of the resource to convey its significance.
- 28 ● Ground-disturbing construction may inadvertently disturb human remains.

29 The alteration of a resource that changes the characteristics that convey its significance is a material
 30 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
 31 CEQA under the Appendix G checklist. Because this construction would materially alter these
 32 categories of resources and disturb human remains it would result in a significant impact. Mitigation
 33 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
 34 where possible, and developing treatment where avoidance is not possible. In addition construction
 35 would be monitored. However, because of the acreage associated with the proposed restoration
 36 under conservation measures, as well as the multiple constraints associated with other
 37 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
 38 resources could be avoided. Therefore, this impact remains significant and unavoidable.

39 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
 40 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
 41 **Implementation of Conservation Measures 2-22**

42 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A.

1 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other**
 2 **Conservation Measures with Plans and Policies**

3 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
 4 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
 5 resources of the Delta. A number of plans and policies that coincide with the study area provide
 6 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
 7 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
 8 Alternative 3 is compatible or incompatible with these policies, rather than whether impacts are
 9 adverse or not adverse or significant or less than significant. Because Alternative 3 would result in
 10 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land
 11 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
 12 BDCP will be compatible with these policies because significant cultural resources will be avoided
 13 where feasible, and mitigation will be implemented to reduce effects where avoidance and
 14 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
 15 some instances because multiple constraints governing the location of proposed facilities makes
 16 preservation of all significant cultural resources unlikely. It should be noted that, as described in
 17 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
 18 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

19 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
 20 the various counties with jurisdiction in this region. For policies that emphasize preservation or
 21 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
 22 agencies will implement cultural resource management practices that will identify significant
 23 resources, preserve such resources where feasible, and complete mitigation to reduce significant
 24 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
 25 incompatible in some instances because multiple constraints governing the location of proposed
 26 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
 27 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
 28 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
 29 environment.

30 **18.3.5.9 Alternative 4—Dual Conveyance with Modified Pipeline/Tunnel and**
 31 **Intakes 2, 3, and 5 (9,000 cfs; Operational Scenario H)**

32 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of**
 33 **Conveyance Facilities**

34 **Identified Resources**

35 Record searches at the CHRIS and inventory efforts for the BDCP have identified ten previously
 36 recorded archaeological sites in the footprint of this alternative (Appendix 18B, Table 18B-1). Site
 37 descriptions summarizing available information regarding these resources, are provided in
 38 Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*. These ten previously recorded
 39 resources represent the known resources that occur in the footprint of this alternative. The majority
 40 of these sites either have burials or cultural constituents or characteristics strongly associated with
 41 burials (such as a “mound” deposit or burial associated items such as *Olivella biplicata* beads).

1 **Significance of Identified Archaeological Resources**

2 Many of the directly affected sites are midden sites, with debris and artifacts associated with
3 prehistoric habitation and residence activities. Midden sites in the Plan Area are often colloquially
4 referred to as “mound sites” because they often form low mounds elevated relative to the
5 surrounding landform. While the original raised deposit has sometimes been destroyed, midden
6 sites often have substantial deposits below the original raised landform that remain intact that
7 typically contain the material remains associated with prehistoric habitation. This organic debris
8 can be used for radiocarbon dating, as well as material that reveals the nature of subsistence
9 activities pursued by prehistoric populations. Because there is no single unified prehistoric
10 chronology for the Delta region, substantial research questions remain unresolved regarding nature
11 and changes of subsistence and settlement activity over the span of the prehistoric occupation of the
12 Delta. The Delta is the prehistoric point of articulation between Central Valley cultures and the
13 aboriginal people that occupied the San Francisco Bay area. Because the cultural chronology and
14 sources of cultural change for the Delta remain unresolved in part, sites in the footprint of this
15 alternative likely contain information that could help clarify these research issues. For this reason
16 these resources are likely significant under the fourth criterion for the CRHR and NRHP.

17 Two of the identified sites contain human burials, as described on the site records. Many of the
18 remaining sites are likely to contain additional burials because midden sites in the Plan Area
19 typically contain human burials or cremations. Burial components within these sites often contain
20 ornaments and other personal items such as charmstones, beads, and other decorative material.
21 Because the style and form of these artifacts change throughout prehistory, and because these
22 stylistic changes have been defined, these materials provide a method of associating archaeological
23 material with specific prehistoric time periods. The ability to associate habitation remains with
24 specific time periods is one of the most significant problems in prehistoric research, because the
25 sequence of specific adaptations and behaviors only becomes clear when a chronology can be
26 constructed that associates behavior and material culture with specific time frames. For this reason
27 these resources are likely significant under the fourth criterion for the CRHR and NRHP.

28 Because many of these resources are large (typically in excess of 30 meters across), they are each
29 likely to contain some portion of the deposit with sufficient integrity to yield artifacts in their
30 original associations in a manner that will convey these significance themes. Therefore these
31 identified resources are likely to qualify as historical resources under CEQA. For the same reasons,
32 these resources are likely to qualify as historic properties under the NRHP.

33 **Impact Mechanisms For Identified Resources**

34 The exact location of these resources cannot be disclosed because such disclosure might lead to
35 damage and disturbance. However, these resources occur within the footprint of both temporary
36 work areas and permanent surface impacts. The resources are distributed evenly across the
37 alignment, but are somewhat clustered where construction of large above-ground features would
38 occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern
39 end of the alignment. Ground-disturbing construction is likely to disturb the deposits and thus
40 materially alter their ability to convey their significance. Much of the data potential in archaeological
41 resources exists in the spatial associations of different artifacts and other cultural material. Where
42 artifacts that have known associations with particular time periods occur adjacent to other material
43 such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows
44 an inference as to the age of the subsistence remains, thereby allowing researchers to infer

1 particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing
 2 construction, vibration, and other physical disturbance may disrupt these associations and thus
 3 disrupt the qualities for which the sites may qualify as historical resources or historic properties. In
 4 addition, because not all identified resources are legally accessible, these resources may be
 5 significant for other reasons than their data potential. Indirect effects such as introduction of
 6 changes to the setting associated with construction of new features or creation of new sources of
 7 noise (also a change to the setting) or vibration may diminish the basis for the significance of these
 8 resources. For these reasons, construction has the potential to materially impair these resources
 9 under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA.

10 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
 11 damage these resources. This damage may impair the integrity of these resources and thus reduce
 12 their ability to convey their significance. For these reasons this effect would be adverse.

13 **CEQA Conclusion:** Construction of conveyance facilities would affect ten identified archaeological
 14 resources that occur in the footprint of this alternative. DWR identified these resources and finds
 15 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
 16 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*). This impact would be significant
 17 because construction could materially alter or destroy the potential of these resources to yield
 18 information useful in archaeological research, the basis for the significance of these resources,
 19 through excavation and disruption of the spatial associations that contain meaningful information.
 20 Identified but currently inaccessible resources may also be significant under other register criteria;
 21 indirect effects such as introduction of new inconsistent changes to the setting may also diminish
 22 the significance of these resources. Mitigation Measure CUL-1 would reduce this impact, but would
 23 not guarantee that all of the scientifically important material would be retrieved because feasible
 24 archaeological excavation only typically retrieves a sample of the deposit, and portions of the site
 25 may remain after treatment with important information. Construction could damage these
 26 remaining portions of the deposit. Therefore, this impact is significant and unavoidable.

27 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
 28 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
 29 **Archaeological Sites**

30 Prior to ground-disturbing construction, DWR will implement treatment for identified and
 31 register eligible archaeological sites affected by Alternative 4 construction.

32 ***Basis for Selection of Treatment***

33 Identified archaeological resources occur in the footprint of large features that would be
 34 constructed under this alternative. Because they occur within the footprint of these features,
 35 avoidance may not be feasible. These objectives include protection of other sensitive
 36 environmental resources where possible. Because of the density and location of other sensitive
 37 environmental resources such as natural communities and habitats, relocation of proposed
 38 facilities necessary to ensure all historical resources are preserved in places is unlikely to be
 39 feasible. Furthermore, the large, linear, nature of proposed conveyance facilities would result in
 40 overlap with cultural resources across almost any potential alignment because of the manner in
 41 which cultural resources are distributed in the study area. These same facilities will require
 42 ongoing maintenance and operational activities that would likely be inconsistent with dedicated
 43 conservation easements or other land management methods designed to preserve existing

1 resources in place. For these reasons, preservation of all potentially affected archaeological sites
2 through capping with soil or incorporation into conservation easements or green space is not
3 likely to be feasible. Accordingly, data recovery is proposed to retrieve the scientifically
4 important material that remains in these deposits. This data recovery excavation will conform to
5 the following standards that meet the Secretary of the Department of the Interior's professional
6 qualification standards provided in 36 CFR 68.

- 7 ● DWR will retain a qualified archaeological consultant to conduct data recovery excavations
8 necessary to retrieve material that would otherwise be lost, (material with scientifically
9 important data associated with the significance of the resource). Qualified archaeological
10 consultant here means a consultant with demonstrated experience conducting effective data
11 recovery excavations at the kinds of sites subject to treatment, including qualification under
12 the Secretary of the Interior's Professional Qualification Standards.
- 13 ● BDCP proponents will prepare, and deposit with the relevant information center of the
14 CHRIS, a data recovery plan prior to conducting these excavations, as required under State
15 CEQA Guidelines Section 15126.4(b)(3)(C). The plan will provide a literature review of
16 recent regional archaeological research and a summary of regional research questions. The
17 plan will incorporate the methods prescribed above and include a more detailed description
18 of the sampling and excavation methods that are appropriate for the regional research
19 questions. The plan will not disclose the location of the resources subject to treatment in a
20 manner that would allow their location by the public and inadvertent damage.
- 21 ● Data recovery excavations will remove a sample of the affected portion of the deposit to
22 retrieve scientifically important material. Excavation will be conducted in representative
23 levels, and material removed will be divided and screened through a combination of 1/4"
24 and 1/8" mesh screen, so as to capture both the gross cultural constituents and the finer
25 material that can only be captured in fine mesh. Excavation will be conducted in 10-
26 centimeter levels so that the horizontal association of different cultural materials is
27 recorded. Removed material will be segregated by type and bagged with labels noting their
28 horizontal and vertical location relative to an established datum point. The datum point will
29 be recorded in the field with GPS to at least 10-centimeter horizontal and vertical accuracy.
30 If, in the course of data recovery excavations, it is determined that, contrary to available
31 evidence, the resource lacks integrity, data recovery excavations will cease.
- 32 ● Faunal material (animal bone) will be segregated and studied by a qualified faunal analyst to
33 identify the species pursued, relative abundance and diversity of different species present,
34 and the manner in which the prey were processed by the prehistoric occupants.
- 35 ● Obsidian glass will be retrieved and studied through both X-ray fluorescence (a method that
36 allows the source of the obsidian to be identified) and obsidian hydration analysis (a
37 method that allows approximate determination of the time when the material was subject to
38 human modification).
- 39 ● Soil samples will be retrieved, with their horizontal and vertical location recorded, for
40 flotation analysis (a method of separating light organic material such as fine plant remains
41 from the deposit, in order to identify plant species pursued by prehistoric populations).
- 42 ● Because some of the resources subject to treatment contain human remains, provisions for
43 such remains are necessary. If human remains are discovered in these deposits during data
44 recovery, the county coroner will be contacted as required in California Health and Safety

1 Code Section 7050.5. If the coroner confirms the remains are of prehistoric origin, the NAHC
 2 will be contacted and given the opportunity to identify a MLD. The MLD will be given the
 3 opportunity to reinter the remains with appropriate dignity. If the NAHC fails to identify the
 4 MLD or if the parties cannot reach agreement as to how to reinter the remains as described
 5 in California PRC Section 5097.98(e), the landowner will reinter the remains at a location
 6 not subject to further disturbance. DWR will ensure the protections prescribed in California
 7 PRC Section 5097.98(e), are performed, such as the use of conservation easements and
 8 recording of the location with whichever county in which the remains are found as well as
 9 the relevant information center of the CHRIS and the NAHC.

- 10 ● After completion of data recovery excavations DWR and appropriate federal agencies will
 11 prepare a data recovery report synthesizing the results of data recovery and associated
 12 studies and analysis. The consultant or staff archaeologists will synthesize the results of
 13 these studies and summarize the results relative to regional research questions in the data
 14 recovery report. The report will be filed with the relevant information center of the CHRIS.
 15 DWR and appropriate federal agencies will also store the recovered material at an
 16 appropriate facility for curation. Relevant federal curation standards such as 36 CFR 79 will
 17 be followed where applicable.
- 18 ● **Construction phase monitoring and resource protection:** During construction on or near
 19 the resource, DWR and appropriate federal agencies will retain a qualified archaeologist (a
 20 person knowledgeable in the identification of the kind of resources known to occur), to
 21 observe excavations over any remaining portions of the deposit that are sensitive for buried
 22 human remains or which may contain other significant buried archaeological material that
 23 could be inadvertently damaged. If human remains are discovered the archaeologist will
 24 direct compliance with the requirements of California Health and Safety Code Section
 25 7050.5 and California PRC Section 5097.98 and the relevant federal agency with
 26 responsibility for Section 106 will be contacted. In addition DWR and the appropriate
 27 federal agencies will use fencing, flagging, or other appropriate means to exclude
 28 unnecessary disturbance and activity from sensitive resources during construction.

29 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
 30 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
 31 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
 32 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
 33 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
 34 into account through the implementation of this programmatic agreement.

35 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory** 36 **Efforts**

37 An inventory for the majority of the footprint for this alternative has not been conducted because
 38 the footprint is not currently legally accessible (Appendix 4A, *Summary of Survey Data Collection by*
 39 *Department of Water Resources to Obtain Information Regarding Baseline Conditions in Areas That*
 40 *Could Be Affected by BDCP*). Furthermore, complete evaluation of all potentially affected resources
 41 associated with this alternative may require destructive test excavation in advance of any final
 42 decision regarding the selection of the alternative. Because several prehistoric archaeological sites
 43 qualifying as historical resources have been identified in the footprint of this alternative, the
 44 remaining portion of the footprint for this conveyance feature is sensitive for previously

1 unidentified archaeological resources. Record searches at the relevant information centers of the
2 CHRIS reviewed the mapped location of previous cultural resource inventories in the footprint of
3 this alternative and the vicinity. This map review revealed that a cultural resources inventory has
4 never been conducted in the majority of the footprint for this alternative. The presence of three
5 archaeological sites that qualify as historical resources and historic properties in the portion of the
6 footprint that has been previously inspected provides a sample of the likely density and occurrence
7 of resources in the remaining footprint. For this reason, additional prehistoric archaeological
8 resources are likely to be found in the portion of the footprint where surveys have not been
9 conducted, once access is available and such studies can be completed.

10 In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era
11 archaeological resources. It is likely that previously unidentified historic archaeological sites occur
12 in the footprint of this alternative because of the intensity of human activity in the Plan Area during
13 the historic era, as described in Section 18.1.6, *Historic-Era Setting*.

14 Prehistoric sites in the Plan Area tend to be large and rich in material remains, including human
15 burials and associated ornaments and beads. Habitation debris also often contains both floral and
16 faunal material that can be used for both radiocarbon dating and analysis regarding subsistence
17 strategies. In addition, the large scale of typical prehistoric archaeological resources suggests
18 portions of these deposits will remain with sufficient integrity to convey research information.
19 Therefore, these sites are likely to qualify as historical resources or unique archaeological resources
20 under CEQA and historic properties under Section 106 of the NHPA.

21 Historic sites are likely to be associated with the historic-era themes of settlement, reclamation,
22 agriculture, and flood management in the Delta region. Because the reclamation and agricultural
23 development of the Delta region provided part of the economic base for the development of
24 surrounding urban centers, these historic themes are significant at both a state and national level.
25 These resources accordingly may contain data useful in historical research. In addition, the intensity
26 of historic activity in the Delta region suggests that many of these resources are likely be distributed
27 across the footprint of this alternative and some are likely to retain sufficient integrity to convey this
28 significance if they are subject to archaeological excavation and investigation. Therefore, these sites
29 are likely to qualify as historical resources or unique archaeological resources under CEQA and
30 historic properties under Section 106 of the NHPA.

31 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
32 resources by disrupting the spatial associations that convey data useful in research or changing the
33 setting such that the resource no longer contains its significance. The locations of various features
34 such as intakes, forebays, and tunnels shaft locations are depicted in Figure M3-4 in the mapbook
35 volume. These impacts would thus materially impair these resources within the meaning of CEQA
36 and adversely affect the resources within the meaning of Section 106 of the NHPA. These effects
37 would be adverse.

38 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
39 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
40 their integrity. For these reasons this effect would be adverse.

41 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
42 resources that cannot be identified at this time because much of the footprint is not legally
43 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
44 archaeological research, as well as the integrity to convey this significance, they are likely to qualify

1 as historical resources or unique archaeological sites under CEQA or historic properties under the
 2 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
 3 these resources by disrupting the spatial associations that could yield important data, resulting in a
 4 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
 5 guarantee that all eligible or significant resources would be preserved in place, or that all important
 6 data would be retrieved before construction destroys these resources. The scale of the BDCP,
 7 investment into existing designs, and the presence of other important environmental resources such
 8 as habitat, natural communities, and wetlands that should be avoided are constraints on the
 9 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

10 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of** 11 **Archaeological Resources**

12 Prior to ground-disturbing construction, DWR will implement the following mitigation
 13 measures.

- 14 ● Because DWR and federal agencies could not feasibly access the majority of the footprint for
 15 this alternative, a cultural resource inventory has not been completed for the entire
 16 footprint. Prior to ground-disturbing construction, DWR will ensure that an inventory and
 17 evaluation report for cultural resources is completed. The inventory will cover the federal
 18 APE for relevant undertakings.
- 19 ● The scope of the inventory will include the entire area where effects may occur. Such effects
 20 consist of direct disturbance through excavation or indirect damage through vibration or
 21 changes to the setting, where the setting may be relevant for archaeological resources.
- 22 ● The work will be led or supervised by cultural resource specialists that meet the Secretary
 23 of the Department of the Interior's professional qualification standards provided in 36 CFR
 24 61.
- 25 ● Inventory methods will include pedestrian surveys and other any other appropriate
 26 sampling methods identified by DWR and the federal lead agencies.
- 27 ● Identified resources will be mapped and described on forms provided by the California State
 28 Parks forms ("DPR" forms). Mapping will be performed by recording data points with GPS
 29 hardware that can be imported and managed digitally.
- 30 ● For all identified resources DWR and appropriate federal agencies will evaluate the
 31 resources to determine if they are any of the following.
 - 32 ○ Historical resources (State CEQA Guidelines Section 15064.5[a])
 - 33 ○ Unique archaeological resources under CEQA (California PRC Section 21083.2[g])
 - 34 ○ Historic properties (36 CFR 60.4)
 - 35 ○ Eligible for local registers
- 36 ● The recorded resources and the resource evaluations will be summarized in an inventory
 37 report. In the inventory report DWR and appropriate federal agencies will also determine if
 38 individual resources qualifying as unique archaeological sites, historical resources, or
 39 historic properties will require mitigation to the extent feasible, as described below. DWR
 40 will make such a determination if the BDCP would involve any of the following
 41 consequences.

- 1 ○ Demolish or materially alter the qualities that make the resource eligible for listing in
2 the CRHR (State CEQA Guidelines Section 15064.5[b][2][A],[C]).
- 3 ○ Demolish or materially alter the qualities that justify the inclusion of the resource on a
4 local register or its identification in an historical resources survey meeting the
5 requirements of California PRC Section 5024.1(g), unless DWR establishes by a
6 preponderance of evidence that the resource is not historically or culturally significant
7 (State CEQA Guidelines Section 15064.5[b][2][B]).
- 8 ○ Alter, directly or indirectly, the qualities that make a resource eligible for listing in the
9 NRHP (36 CFR 800.5[a][1]).
- 10 ○ Demolish or materially impair the qualities that allow a resource to qualify as a unique
11 archaeological site (California PRC Section 21083.2).
- 12 ● For all resources qualifying as unique archaeological resources, historical resources, or
13 historic properties that would be subject to significant effects, DWR will develop and
14 implement treatment. Such treatment will consist of the following, in order of priority.
- 15 ○ It should be noted that this order of priority applies to mitigation on historical resources
16 performed to satisfy CEQA. Relevant federal agencies with management responsibilities
17 for cultural resources shall implement mitigation for adverse effects to satisfy Section
18 106 of the NHPA, which does not specify this order of priority.
- 19 ○ Preservation in place where feasible, in light of costs, logistics, technological, and
20 environmental considerations, and the extent to which avoidance is consistent with the
21 objectives of the project, through methods such as redesign of relevant facilities to avoid
22 destruction or damage to eligible cultural resources, capping resources with fill, or
23 deeding resources into conservation easements.
- 24 ○ Review and study of existing collections previously retrieved from affected resources,
25 where feasible, in lieu of data recovery excavations.
- 26 ○ Data recovery excavations that retrieve the information that makes the resource eligible
27 for CRHR or NRHP listing, or that qualifies the site as a unique archaeological resource.
28 If data recovery through excavation is the only feasible mitigation, a data recovery plan,
29 which makes provisions for adequately recovering the scientifically consequential
30 information from and about the historical resource, will be prepared and adopted prior
31 to any excavation being undertaken. Such studies will be deposited with the relevant
32 information center of the CHRIS. Excavation as mitigation will be restricted to those
33 parts of the resource that would be damaged or destroyed by the BDCP. If, in the course
34 of data recovery excavations, it is determined that contrary to available evidence, the
35 resource lacks integrity, data recovery excavations will cease. The data recovery plan
36 will specify the basis for the significance of the resource and methods for retrieving the
37 consequential information from the site. After completion of excavation DWR will retain
38 a qualified archaeological consultant to synthesize the findings into a data recovery
39 report describing the findings and will deposit the report at the relevant information
40 center of the CHRIS.
- 41 ● The treatment plan will identify treatment methods that are proposed by the Lead Agencies
42 and other public entities. The plan will also specify the basis for selecting a particular
43 mitigation measure.

- 1 • For archaeological sites that qualify as historical resources, the BDCP proponents will
2 consider preservation in place as the preferred treatment where feasible, in light of costs,
3 logistics, technological, and environmental considerations and the extent to which
4 avoidance is consistent with the objectives of the project
- 5 • If preservation in place of archaeological sites that qualify as historical resources or unique
6 archaeological resources is not feasible in light of costs, logistics, technological
7 considerations, the location of the find, and the extent to which preservation of the find is
8 consistent or inconsistent with the design and objectives of the BDCP, the BDCP proponents
9 will include a discussion in the treatment plan describing why the selected mitigation serves
10 the interests protected by CEQA better than preservation in place.
- 11 • **Construction phase monitoring:** During construction on or near resources sensitive for
12 human remains, DWR will retain a qualified archaeologist to observe excavations over any
13 remaining portions of the deposit that are sensitive for buried human remains. If human
14 remains are discovered the archaeologist will direct compliance with the requirements of
15 California Health and Safety Code Section 7050.5 and California PRC Section 5097.98 and
16 the relevant federal agency with responsibility for Section 106 will be contacted. If Native
17 American human remains are discovered on federal land, work in the immediate vicinity
18 will cease, and DWR will contact the relevant representative of the federal agency where the
19 remains were discovered, as prescribed in 25 USC Section 3002(d) (NAGPRA). After
20 notification from the relevant agency representative and treatment of the remains as
21 required under NAGPRA, work may continue. Disposition of the remains will follow the
22 ownership priority described in NAGPRA (25 USC Section 3002[a]).

23 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
24 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
25 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
26 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
27 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
28 into account through the implementation of this programmatic agreement.

29 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory** 30 **Efforts**

31 Appendix 18A, *Archaeological Resources Sensitivity Assessment*, presents an overview of the
32 sensitivity of the Plan Area for previously unidentified archaeological resources and demonstrates
33 that additional prehistoric and historic-era sites that have not yet been identified are almost certain
34 to occur in the portion of the Plan Area where this alternative would be constructed. While surveys
35 will be completed for the footprint, once access is available, such surveys cannot guarantee that all
36 sites will be identified prior to construction. The rapid rate of at which alluvium and sediment
37 accumulates in the Delta region, and the geologically unstable nature of the floodplain and riverbank
38 environments in which these resources may occur makes it likely that numerous sites occur buried
39 below surface soils. Cultural resource inventory efforts cannot always identify such resources, even
40 with intermittent surface excavation designed to reveal sites with little or no surface manifestation
41 because exhaustive sampling to identify every resource is economically and technically infeasible.
42 These sites may also occur buried at the depth at which tunnel boring operations would be
43 performed.

1 Many of these unidentified prehistoric resources are likely to qualify as historical resources, historic
2 properties, or unique archaeological resources because prehistoric sites in the Delta region tend to
3 be large and contain a rich material culture. In particular, burial features tend to be associated with
4 numerous shell ornaments, charmstones, and associated grave goods. Habitation components often
5 contain abundant faunal and floral remains that elucidate prehistoric adaptations such as
6 subsistence methods.

7 In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era
8 archaeological resources. Archaeological debris found in historic era archaeological sites activity is
9 likely to be associated with significant themes such as agriculture, reclamation, and settlement of the
10 Delta region. The size of the Plan area and the intensity of historic activity suggest that some of these
11 resources may qualify as historical resources, historic properties, or unique archaeological
12 resources.

13 Ground-disturbing work, including the construction of surface features such as intakes, and the
14 subterranean tunnel boring operations and shafts may disturb and damage these resources before
15 they can be identified and avoided during monitoring efforts required under Mitigation Measure
16 CUL-3. This damage and disturbance may materially impair these resources within the meaning of
17 CEQA or adversely affect the resources within the meaning of Section 106 because this disturbance
18 would impair the ability of these resources to yield data useful in research. While Mitigation
19 Measure CUL-3 would reduce the potential for this impact, it would not guarantee the impact would
20 be avoided entirely. Therefore, this impact is adverse.

21 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
22 sites that also may not necessarily be identified prior to construction. While cultural resource
23 inventories will be completed once legal access is secured, no inventory can ensure that all
24 resources are identified prior to construction. Because these sites may qualify for the NRHP or
25 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
26 adverse.

27 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
28 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
29 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
30 disrupt the spatial associations that contain scientifically useful information it would alter the
31 potential basis for eligibility, thus materially altering the resource and resulting in a significant
32 effect. Because these resources would not be identified prior to construction, they cannot be
33 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
34 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
35 worker training, monitoring and discovery protocols. However, because archaeological resources
36 may not be identified prior to disturbance through these measures, the effect cannot be entirely
37 avoided. Therefore, this impact would remain significant and unavoidable.

38 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
39 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

40 Prior to ground-disturbing construction, the BDCP proponents will include a cultural resources
41 discovery plan in the contract conditions of the construction contractor, incorporating the
42 following actions to be taken in the event of the inadvertent discovery of cultural resources.

- 1 ● An archaeological monitor will be present to observe construction at geographic locations
2 that are sensitive for unidentified cultural resources. Such locations consist of construction
3 near identified sites (within a 100-foot radius around the known boundaries of identified
4 resources), and where ground-disturbing construction will occur within 500 feet of major
5 water features.
- 6 ● In the event of an archaeological resources discovery, work will cease in the immediate
7 vicinity of the find (typically 100-feet), based on the direction of the archaeological monitor
8 or the apparent distribution of cultural resources if no monitor is present. A qualified
9 archaeologist will assess the significance of the find and make recommendations for further
10 evaluation and treatment as necessary.
- 11 ● Discovered resources will be mapped and described on forms provided by the DPR.
12 Mapping will be performed by recording data points with GPS hardware that can be
13 imported and managed digitally.
- 14 ● Evaluation and treatment will follow the standards and order of priority described above for
15 Mitigation Measure CUL-2. After receiving recommendations from the qualified
16 archaeologist, DWR and appropriate federal agencies shall jointly determine the feasibility
17 of such recommendations, and particularly any recommended avoidance measures, in light
18 of factors such as costs, logistics, technological, and environmental considerations and the
19 extent to which avoidance is consistent with the objectives of the project.
- 20 ● If human remains are discovered as part of a larger cultural deposit, DWR and the
21 contractors will coordinate with the county coroner and NAHC to make the determinations
22 and perform the management steps prescribed in California Health and Safety Code Section
23 7050.5 and California PRC Section 5097.98.
- 24 ● If Native American human remains are discovered on federal land, work in the immediate
25 vicinity will cease, and DWR will contact the relevant representative of the federal agency
26 where the remains were discovered, as prescribed in 25 USC Section 3002(d) (NAGPRA).
27 After notification from the relevant agency representative and treatment of the remains as
28 required under NAGPRA, work may continue. Disposition of the remains will follow the
29 ownership priority described in NAGPRA (25 USC Section 3002[a]), as defined below under
30 Mitigation Measure CUL-4.
- 31 ● DWR and appropriate federal agencies shall provide pre-construction training of all
32 construction personnel engaged in construction that has the potential to affect
33 archaeological resources. This training will provide instruction on how to identify resources
34 in the field and appropriate measures to be taken if a discovery or potential discovery
35 occurs.

36 DWR will include a list of DWR cultural-resources staff that can respond to cultural resource
37 discoveries and provide management direction following discoveries in the construction
38 training materials, and will also provide this list as well as these discovery requirements to the
39 supervisory field staff for the construction workers.

40 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
41 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
42 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
43 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on

1 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
2 into account through the implementation of this programmatic agreement.

3 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

4 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
5 rather than as part of prehistoric or historic archaeological sites. Historic and prehistoric human
6 remains have been discovered as isolated interments rather than as part of larger sites. Because
7 these isolated resources are not associated with larger deposits, their distribution and depth cannot
8 be estimated. Construction of this alternative would require ground-disturbing work that may
9 damage previously unidentified human remains, resulting in direct effects on these resources. While
10 inventory and monitoring efforts are prescribed above under Mitigation Measures CUL-2 and CUL-3,
11 the large acreages subject to disturbance under this alternative make exhaustive sampling to
12 identify all buried and isolated human remains technically and economically infeasible. For these
13 reasons the potential remains that such resources may be damaged or exposed before they can be
14 discovered through inventory or monitoring. This effect would be adverse.

15 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
16 may occur either in isolation or as part of identified and previously unidentified archaeological
17 resources where construction will occur. This effect would be adverse.

18 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
19 remains. Construction would likely result in disturbance of these features. Disturbance of human
20 remains, including remains interred outside of cemeteries is considered a significant impact in the
21 CEQA Appendix G checklist, therefore disturbance of these remains would result in a significant
22 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
23 significant level because mitigation would not guarantee that these features could be discovered and
24 treated in advance of construction; the scale of construction makes it technically and economically
25 infeasible to perform the level of sampling necessary to identify all such resources prior to
26 construction. Therefore, this impact is considered significant and unavoidable.

27 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if** 28 **Such Resources Are Discovered during Construction**

- 29 ● If human remains are discovered as part a larger cultural deposit, the BDCP proponents and
30 the construction contractors will coordinate with the county coroner and NAHC to make the
31 determinations and perform the management steps prescribed in California Health and
32 Safety Code Section 7050.5 and California PRC Section 5097.98. The provisions of these
33 state laws apply unless discoveries occur on land owned or controlled by the federal
34 government. For discoveries on federal land the bulleted procedures for NAGPRA, provided
35 below shall be followed. Compliance with state law for discoveries occurring on private or
36 state lands requires the following steps.
 - 37 ○ Notification of the county coroner so the coroner may determine if an investigation
38 regarding the cause of death is required. If the coroner determines that the remains are
39 of prehistoric Native American origin, the coroner will notify the NAHC.
 - 40 ○ Upon notification the NAHC will identify the MLD, and the MLD will be given the
41 opportunity to reinter the remains with appropriate dignity. If the NAHC fails to identify
42 the MLD or if the parties cannot reach agreement as to how to reinter the remains as
43 described in California PRC Section 5097.98(e), the landowner will reinter the remains

1 at a location not subject to further disturbance. DWR will ensure the protections
 2 prescribed in California PRC Section 5097.98(e), are performed, such as the use of
 3 conservation easements and recording of the location with the relevant county and
 4 information center of the CHRIS.

- 5 • If Native American human remains are discovered on federal land, work in the immediate
 6 vicinity will cease, and DWR will contact the relevant representative of the federal agency
 7 where the remains were discovered, as prescribed in 25 USC Section 3002(d) (NAGPRA).
 8 After notification from the relevant agency representative and treatment of the remains as
 9 required under NAGPRA, work may continue. Disposition of the remains will follow the
 10 ownership priority described in NAGPRA (25 USC Section 3002[a]):
 - 11 ○ Where the lineal descendants can be found, the lineal descendants own the remains.
 - 12 ○ Where the lineal descendants cannot be found, the remains belong to the Indian tribe on
 13 whose land the remains were found.
 - 14 ○ If the remains are discovered on other lands owned or controlled by the federal
 15 government and the lineal descendants cannot be determined, the remains belong to the
 16 Indian tribe that is culturally affiliated with the remains, or the tribe that aboriginally
 17 occupied the land where the remains were discovered.
 - 18 ○ “Indian Tribe” here means federally recognized tribes identified in the list of such tribes
 19 published by the Bureau of Indian Affairs in the *Federal Register* as well as in the tribal
 20 directory compiled by the BIA.

21 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
 22 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
 23 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
 24 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
 25 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
 26 into account through the implementation of this programmatic agreement.

27 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic** 28 **Architectural/Built-Environment Resources Resulting from Construction Activities**

29 Built-environment resources that may be affected by this alternative include resources identified
 30 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
 31 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 32 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 33 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 34 18B, Table 18B-9, a total of 18 built-environment resources have the potential to be directly or
 35 indirectly affected by construction of this alternative. Some of these resources have multiple
 36 contributing elements, as described in Appendix 18B. The specific nature and location of the impact
 37 mechanism for each affected resource is also described in Table 18B-9. The affected resources have
 38 been evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each
 39 resource is provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

40 **Discussion of Anticipated Effects on Identified and Accessible Resources**

41 The construction of intakes, transmission lines, RTM spoil areas and other features would result in
 42 direct and indirect effects on identified and eligible resources. The exact effect mechanism for each

1 resource is described in Appendix 18B, in Table 18B-9. Facility redesign to avoid direct impacts on
2 historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all
3 identified resources can be avoided because of the scale of the BDCP and the need to balance
4 avoidance of other important environmental resources such as wetlands, natural communities, and
5 special-status species habitat. These effects would materially impair the resources within the
6 meaning of CEQA and result in adverse effects within the meaning of Section 106 because they
7 would diminish the characteristics that convey the significance of the resources. Some direct
8 demolition and indirect effects such as setting changes are likely to occur even with mitigation.
9 Therefore, these effects would be adverse.

10 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
11 built environment resources. These alterations may diminish the integrity of these resources. For
12 these reasons this effect would be adverse.

13 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
14 in the footprint of this alternative (18 individual resources, as described in Appendix 18B, Table
15 18B-9). These resources have been evaluated for the CRHR and qualify as historical resources under
16 CEQA. Construction of conveyance facilities may require demolition of the historic built-
17 environment resources. Construction may also result in permanent indirect effects such as changes
18 to the setting. Direct demolition or changes to the setting would be material alterations because they
19 would either remove the resource or alter the resource character, resulting in an inability of the
20 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
21 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
22 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
23 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
24 even with implementation of the following mitigation measures.

25 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built**
26 **Environment Treatment Plan**

27 All mitigation will be undertaken by individuals who meet the Secretary of the Interior's
28 professional qualifications and have demonstrable experience conducting the following
29 recommended measures. In preparation of the built environment treatment measures relevant
30 parties will be consulted. Such parties may include but are not limited to the SHPO, the ACHP,
31 local historical societies, and other interested parties such as local preservation and community
32 organizations. DWR will perform the following measures as part of mitigation and monitoring
33 for compliance with CEQA. Appropriate federal agencies shall perform these measures as part of
34 their management responsibilities performed to satisfy Section 106 of the NHPA. Property
35 specific mitigation is identified in Tables 18B-17 through 18B-31. Typical mitigation for affected
36 and eligible properties consists of the following:

37 A BETP will be prepared by an architectural historian with demonstrated experience preparing
38 treatment for similar kinds of resources, and reviewed by relevant parties prior to any
39 demolition or ground-disturbing activity for all built-environment resources subject to adverse
40 effects or significant impacts. The following protective measures and monitoring protocols will
41 be implemented for historic resources in close proximity to the project but that are not
42 anticipated to be directly affected by demolition or construction but which may be subject to
43 direct effects such as vibration or inadvertent damage activities:

- 1 ● HSR will be prepared for buildings and structures adjacent to the project for which detailed
2 information is required to develop protection measures. These will be done for buildings
3 and structures that appear to be in poor condition and, therefore, potentially sensitive to
4 construction-related activities such as vibration. Preconstruction stabilization or temporary
5 removal of these buildings may be necessary.
- 6 ● Preconstruction condition assessments will be prepared for buildings and structures
7 adjacent to the project that are stable, but could be unintentionally damaged during
8 construction. Should there be any question as to whether or not the project caused damage,
9 these condition assessments will provide confirmation of the preconstruction condition.
- 10 ● Precautions to protect built resources from construction vehicles, debris and dust may
11 include fencing or debris meshing. Temporary mothballing, and fire and intrusion
12 protection may be needed if the buildings are unoccupied during construction.
- 13 ● Protective measures will be field checked as needed during construction by a qualified
14 architectural historian with demonstrated experience conducting monitoring of this nature.
15 Vibration monitoring may be required for buildings determined to be susceptible to
16 vibration damage that are in close proximity to construction activities or machinery that
17 cause vibration.
- 18 ● These measures are designed to avoid direct effects such as vibration that may result in
19 structural damage or inadvertent direct effects such as demolition.
- 20 ● Redesign of relevant facilities will be used to avoid destruction or damage where feasible.

21 For built resources that will be directly and adversely impacted, mitigation typically includes:

- 22 ● HABS records will be prepared for CRHR and NRHP-eligible historic buildings and
23 structures that will be demolished (National Park Service 2000). These reports will include
24 written and photographic documentation of the significant and character-defining features
25 of these properties. These reports will minimize the adverse effect by capturing and
26 preserving a description of the significant information and characteristics associated with
27 the resource.
 - 28 ○ All HABS reports are subject to review and approval by the National Park Service.
29 Following approval, the BDCP lead agencies will produce sufficient copies for
30 distribution to identified repositories, including the Library of Congress, the California
31 State Library, the University of California Water Resources Center Archives, and any
32 local repositories, as appropriate and agreed upon with the SHPO and interested parties.
33 Distribution will further enhance the mitigation of the adverse effect because it will
34 ensure that the significance is retained and conveyed to a wide audience.
- 35 ● As applicable, HALS records and HAER documents will be prepared for historic water-
36 associated resources (National Park Service 2005). The levees and other CRHR and NRHP-
37 eligible linear historic features will be recorded following HAER guidelines. Additionally the
38 settings will be recorded following HALS guidelines. These reports will include written and
39 photographic documentation of the significant and character-defining features of these
40 properties. The HALS and HAER reports will minimize the adverse effect by capturing and
41 retaining a description of the significant engineering and design information associated with
42 the resource.

- 1 ○ All HALS/HAER reports are subject to review and approval by the National Park Service.
 2 Following approval, the BDCP lead agencies will produce sufficient copies for
 3 distribution to identified repositories, including the Library of Congress, the California
 4 State Library, the University of California Water Resources Center Archives, and any
 5 local repositories, as appropriate and agreed upon with the SHPO and interested parties.
 6 Distribution will further enhance the mitigation of the adverse effect because it will
 7 ensure that the significance is retained and conveyed to a wide audience.
- 8 ● Salvage of materials will be performed to the extent feasible to enable the restoration of
 9 similar buildings, structures, or water-conveyance features outside of the area of direct
 10 impact. Salvage will further minimize adverse effects by using salvaged materials to ensure
 11 that similar resources are restored and maintained in manner that will ensure the
 12 significance of the resource is preserved.

13 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
 14 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
 15 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
 16 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
 17 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
 18 into account through the implementation of this programmatic agreement.

19 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic**
 20 **Architectural/Built-Environment Resources Resulting from Construction Activities**

21 Because DWR does not have legal access to the majority of the footprint for this alternative,
 22 inventory efforts in the entire footprint have not been completed. Nonetheless, the intensity of
 23 activity in the Delta region during the historic era and a review of available data such as aerial
 24 photographs suggest that numerous additional resources occur in the footprint that have not been
 25 identified or which cannot currently be accessed and evaluated.

26 Review of available data such as aerial photographs, historic topographic maps, and assessors'
 27 records also indicates that many of these inaccessible properties are 45 years of age or older and
 28 have the potential to be eligible historic resources. Approximately 37 unevaluated built-
 29 environment resources have been identified that may be subject to direct or indirect effects as a
 30 result of the construction of this alternative (ICF 2013, see tables of inaccessible properties and
 31 associated maps, one inaccessible property was determined NRHP-eligible and is not counted here
 32 but included under CUL-5 for this alternative). Many of these resources are likely to be significant
 33 because they may be associated with the important historical themes described above in Section
 34 18.1.6, *Historic-Era Setting*. In addition, such resources may be associated with historically
 35 significant persons, or may represent significant artistic values. Thus the resources may have
 36 significance under both CEQA (State CEQA Guidelines Section 15064.5[a][3]) and the NRHP (30 CFR
 37 60.4). In addition, because many of the historic-era structures in the Delta region are intact, and
 38 retain their rural agricultural setting, many of these resources are likely to have integrity within the
 39 meaning of CEQA and the NRHP (14 CCR Section 4852[c], 30 CFR 60.4). Because many unidentified
 40 resources are likely to have significance and integrity, they may qualify as historical resources under
 41 CEQA and historic properties under Section 106 of the NHPA.

1 Anticipated Effects

2 Construction may result in direct demolition of these resources, damage through vibration, or
 3 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
 4 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
 5 guarantee that eligible resources would be avoided and that adverse changes to the setting would
 6 not occur. The scale of the BDCP and other design constraints, such as the presence of other
 7 important environmental resources, makes avoidance of all direct and indirect effects unlikely.
 8 Therefore, this effect would be adverse.

9 Traditional cultural properties may also occur within the footprint of this alternative. These
 10 resources consist of built environment features or activity areas that are important in the cultural
 11 life of a living community. Examples of such resources include local gathering halls and Native
 12 American traditional activity areas. Where these resources have both integrity of condition and
 13 integrity of relationship, and meet the criteria for listing in the NRHP, they can qualify as historic
 14 properties (National Park Service 1998:11–12). Resources that are NRHP-eligible would also be
 15 historical resources under CEQA (California PRC Section 5024.1[d][1]) Construction has the
 16 potential to directly or indirectly damage built-environment resources through demolition or
 17 introduction of new inconsistent features into the setting. These changes would impair the ability of
 18 the resources to convey their significance because the character defining elements or setting of the
 19 resource would be lost. Therefore, impacts on these resources may be adverse.

20 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
 21 inaccessible and NRHP and CRHR-eligible resources. These changes may diminish the integrity of
 22 these resources. For these reasons, this effect would be adverse.

23 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
 24 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
 25 efforts have not gathered complete information in these inaccessible areas. Many of these resources
 26 are likely to be associated with important historical themes or persons, or possess high creative
 27 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
 28 these resources remain intact and retain their rural agricultural setting they are also likely to have
 29 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
 30 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
 31 demolition of the historic built-environment resources. Construction may also result in permanent
 32 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
 33 material alterations because they would either remove the resource or alter the resource character,
 34 resulting in an inability of the resource to convey its significance. For these reasons this would be a
 35 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
 36 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
 37 environmental resources make avoidance of all significant effects unlikely. For these reasons this
 38 impact remains significant and unavoidable even with implementation of the following mitigation
 39 measures.

40 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess** 41 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and** 42 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

43 Because DWR does not have legal access to the majority of the footprint for this alternative, a
 44 built resources inventory has not been completed for the entire footprint for this alternative.

1 Prior to construction, the BDCP proponents will ensure that an inventory and evaluation report
 2 is completed within all areas where effects on built resources may occur. This subsequent
 3 survey will be conducted in a manner consistent with the May–June 2012 survey.

- 4 ● The scope of the inventory will include the entire area where effects may occur that were
 5 inaccessible or partially inaccessible in the first survey efforts. Such effects consist of direct
 6 disturbance, damage through vibration, or changes to the setting.
- 7 ● The work will be led or supervised by architectural historians that meet the Secretary of the
 8 Department of the Interior’s professional qualification standards provided in 36 CFR 61.
- 9 ● Inventory methods and evaluation will include pedestrian surveys, photographic
 10 documentation, historical research using both primary and secondary sources, and
 11 interviews and oral histories.
- 12 ● Newly identified resources will be mapped and described on forms provided by the DPR.
 13 Mapping will be performed by recording data points with GPS hardware that can be
 14 imported and managed digitally.
- 15 ● For all identified resources, DWR will evaluate the resources to determine if they are any of
 16 the following.
 - 17 ○ Historical resources (State CEQA Guidelines Section 15064.5[a])
 - 18 ○ Significant historic resources under CEQA (California PRC Section 21084.1)
 - 19 ○ Historic properties (36 CFR 60.4)
 - 20 ○ Eligible for local registers
- 21 ● The recorded resources and the resource evaluations will be summarized in an inventory
 22 report. In the inventory report, DWR will also determine if individual resources qualifying as
 23 historical resources or historic properties will be subject to significant effects. DWR will
 24 make such a finding if the BDCP would result in the following.
 - 25 ○ Demolish or materially alter the qualities that make the resource eligible for listing in
 26 the CRHR (State CEQA Guidelines Section 15064.5[b][2][A],[C]).
 - 27 ○ Demolish or materially alter the qualities that justify the inclusion of the resource on a
 28 local register or its identification in an historical resources survey meeting the
 29 requirements of California PRC Section 5024.1(g), unless DWR establishes by a
 30 preponderance of evidence that the resource is not historically or culturally significant
 31 (State CEQA Guidelines Section 15064.5[b][2][B]).
 - 32 ○ Alter, directly or indirectly, the qualities that make a resource eligible for listing in the
 33 NRHP (36 CFR 800.5[a][1]).
 - 34 ○ Cause a substantial adverse change in the significance of an historical resource
 35 (California PRC Section 21084.1).

36 Where built-environment resources that are listed or qualify for listing in the CRHR or NRHP, or
 37 that have been designated as locally significant, or are otherwise identified by DWR as historical
 38 resources will be subject to significant effects, DWR will prepare a BETP. The treatment plan will
 39 provide detailed descriptions of treatment measures that will be implemented to avoid, protect,
 40 minimize, and mitigate adverse effects on historic properties in accordance with the Secretary of
 41 the Interior’s Standards for the Treatment of Historic Properties (36 CFR 68) and the National

1 Park Service's Guidelines for the Treatment of Cultural Landscapes. The treatment plan will
2 describe work to be done prior to, during, and after construction.

- 3 ● Where feasible, in light of costs, logistics, technological and environmental considerations,
4 and the extent to which avoidance is consistent with the objectives of the project, DWR will
5 first seek to avoid demolition or materially altering the historical resource by avoidance
6 measures, such as the following.
 - 7 ○ Construction condition assessments or HSRs of properties adjacent to construction to
8 determine if these properties are at risk of being damaged.
 - 9 ○ Redesign of relevant facilities to avoid destruction or damage.
 - 10 ○ Determination of tolerable levels of construction vibration
 - 11 ○ Stabilization design and implementation to ensure fragile built resources are not
12 damaged by construction activities
 - 13 ○ Temporarily moving built resources, or other measures determined appropriate.
- 14 ● If avoidance is not feasible, DWR will implement treatment measures such as, but not
15 limited to the following examples of treatments used to minimize effects on built-
16 environment resources.
 - 17 ○ Redesign of relevant facilities to minimize the scale or extent of damage to eligible or
18 listed built resources.
 - 19 ○ Design standards to minimize the visual impact and to ensure context-appropriate
20 design.
 - 21 ○ Complete documentation in accordance with HABS/HAER/HALS programs, including
22 written and photographic documentation of the significant qualities of the CRHR and
23 NRHP listed and determined eligible districts or individually eligible resources (where
24 resources cannot be avoided).
 - 25 ○ Relocation of historic buildings that would otherwise be demolished.
 - 26 ○ Following the Secretary of the Interior's standards to restore built resources outside of
27 the area of direct effect that are of the same type as resources that will be demolished by
28 the BDCP.
 - 29 ○ Other appropriate treatment methods that are identified in relation to particular
30 resources that are affected.

31 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
32 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
33 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
34 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
35 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
36 into account through the implementation of this programmatic agreement.

37 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

38 This impact describes the potential effects of other conservation measures at a program level of
39 detail, with the exception of *CM1 Water Facilities and Operation*. The following conservation
40 measures would not result in impacts on cultural resources because they consist of changes to

1 existing activities, or planning and regulatory actions that do not have the potential to result in
 2 ground-disturbing work with effects on cultural resources.

- 3 • *CM11: Natural Communities Enhancement and Management*
- 4 • *CM12: Methylmercury Management*
- 5 • *CM13: Invasive Aquatic Vegetation Control*
- 6 • *CM14: Stockton Deep Water Ship Channel Dissolved Oxygen Levels*
- 7 • *CM15: Predator Control*
- 8 • *CM16: Nonphysical Fish Barriers*
- 9 • *CM17: Illegal Harvest Reduction*
- 10 • *CM19: Urban Stormwater Treatment*
- 11 • *CM20: Recreational Users Invasive Species Program*
- 12 • *CM21: Nonproject Diversions*
- 13 • *CM22: Avoidance and Minimization Measures*

14 Implementation of the remaining conservation measures could result in effects on prehistoric and
 15 historic archaeological resources, as well as TCPs and the built environment because the scope of
 16 conservation actions includes large areas of land, and the areas identified for potential restoration
 17 or other conservation actions are sensitive for cultural resources, including prehistoric and historic
 18 archaeological sites as well as human remains, architectural resources, and rural historic
 19 landscapes. Specific conservation actions that would result in foreseeable ground-disturbing work
 20 that could alter or impair the significance of NRHP-, CRHR-, or local registry-eligible cultural
 21 resources are listed below.

- 22 • *CM2: Yolo Bypass Fisheries Enhancement*
- 23 • *CM3: Natural Communities Protection and Restoration*
- 24 • *CM4: Tidal Natural Communities Restoration*
- 25 • *CM5: Seasonally Inundated Floodplain Restoration*
- 26 • *CM6: Channel Margin Enhancement*
- 27 • *CM7: Riparian Natural Community Restoration*
- 28 • *CM8: Grassland Natural Community Restoration*
- 29 • *CM9: Vernal Pool Complex Restoration*
- 30 • *CM10: Nontidal Marsh Restoration*
- 31 • *CM18: Conservation Hatcheries*

32 These measures would result in effects on cultural resources when ground-disturbing work is
 33 performed to construct improvements and enhance or restore natural communities. Direct effects
 34 would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible
 35 prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and
 36 built-environment resources. Indirect effects may occur where changes to the setting alter the
 37 existing setting in a manner that is inconsistent with the feeling and association of the resource.

1 Because the ability of the resources to convey their significance would be lost this effect would
 2 materially alter these resources under CEQA and would be adverse under NEPA. For example,
 3 reclaimed agricultural landscapes that are converted to habitat may no longer convey the themes of
 4 agriculture and settlement, and thus would be inconsistent with remaining features associated with
 5 rural historic landscapes created by reclamation, cultivation, and ranching.

6 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
 7 land included in all conservation measures that would be implemented under this alternative, it is
 8 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
 9 archaeological sites could be avoided. Therefore, this impact would be adverse.

10 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
 11 introduction of new infrastructure to the Plan Area. These physical modifications may result in
 12 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
 13 integrity of these resources. For these reasons these effects would be adverse.

14 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
 15 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
 16 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
 17 built-environment resources such as historic architectural structures and rural historic landscapes.
 18 The same construction may damage unique archaeological sites. This construction would likely
 19 result in materially adverse changes for the following reasons.

- 20 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
 21 contain data useful in research, thus diminishing or destroying the basis for the significance of
 22 the resource.
- 23 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
 24 built-environment resources, resulting in an inability of the resource to convey its significance.
- 25 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
 26 resulting in an inability of the resource to convey its significance.
- 27 ● Ground-disturbing construction may inadvertently disturb human remains.

28 The alteration of a resource that changes the characteristics that convey its significance is a material
 29 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
 30 CEQA under the Appendix G checklist. Because this construction would materially alter these
 31 categories of resources and disturb human remains it would result in a significant impact. Mitigation
 32 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
 33 where possible, and developing treatment where avoidance is not possible. In addition construction
 34 would be monitored. However, because of the acreage associated with the proposed restoration
 35 under conservation measures, as well as the multiple constraints associated with other
 36 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
 37 resources could be avoided. Therefore, this impact remains significant and unavoidable.

38 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
 39 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
 40 **Implementation of Conservation Measures 2-22**

41 As part of the site-specific environmental review for all conservation measures other than *CM1*
 42 *Water Facilities and Operation* that could involve adverse effects on cultural resources within the

1 meaning of NEPA, or significant impacts on cultural resources within the meaning of CEQA, the
 2 BDCP proponents will conduct cultural resource studies and develop mitigation measures. The
 3 cultural resource studies will include the following steps.

- 4 • Record searches at the relevant information centers of the CHRIS to retrieve records of
 5 identified resources. Inventories will consist of surveys using both historical and map
 6 research as well as field-inspection. Evaluation will consist of assessment of identified
 7 resources to determine if they have both significance and integrity sufficient to qualify for
 8 the CRHR, and NRHP, as well as any relevant local registers.
- 9 • Cultural resource inventories and evaluations that identify archaeological resources and
 10 built-environment resources.
- 11 • Correspondence or discussion with the Native American contacts on file with the NAHC and
 12 relevant tribes from the list of relevant federally recognized tribes that qualify as *Indian*
 13 *tribes*, as used in 36 CFR 800.16(m), maintained by the BIA, in order to identify resources
 14 that may be known to the Native American community, and to incorporate their preferences
 15 for treatment and management.
- 16 • Resource-specific evaluations that apply the criteria to determine if the identified resources
 17 qualify as historical resources (State CEQA Guidelines Section 15064.5[a]) or unique
 18 archaeological resources under CEQA (California PRC Section 21083.2[g]), historic
 19 properties (36 CFR 60.4), or are eligible for local registers.
- 20 • Resource-specific treatment for historical resources, unique archaeological resources, and
 21 historic properties that would be materially impaired as defined in CEQA (State CEQA
 22 Guidelines Section 15064.5[b][1]) or adversely affected, as defined in the Section 106
 23 regulations (36 CFR 800.5[a][1]).

24 Treatment and mitigation will include the following elements and steps.

- 25 • Treatment for archaeological resources qualifying as historical resources that are subject to
 26 significant effects will follow the order of preference described in State CEQA Guidelines
 27 Section 15126.4[b][3].
- 28 • Treatment for unique archaeological resources subject to significant effects will conform to
 29 the mitigation prescribed under CEQA (California PRC Section 21083.2[b])
- 30 • Treatment for historic properties subject to adverse effects will seek to avoid or minimize
 31 the consequences of the BDCP that would diminish the characteristics that make the historic
 32 property eligible for inclusion in the NRHP.
- 33 • Treatment plans or mitigation measures in environmental documents will include
 34 monitoring and discovery plans that provide for observation of construction to avoid
 35 inadvertent effects on previously unidentified human remains and cultural resources, to the
 36 extent feasible.
- 37 • Treatment plans or mitigation measures in environmental documents will also include the
 38 notification and consultation provisions required for discoveries of human remains
 39 provided in California Health and Safety Code Section 7050.5 and California PRC Section
 40 5097.98.
- 41 • If Native American human remains are discovered on federal land, work in the immediate
 42 vicinity will cease and DWR will contact the relevant representative of the federal agency

1 where the remains were discovered, as prescribed in 25 USC Section 3002(d) (NAGPRA).
 2 After notification from the relevant agency representative and treatment of the remains as
 3 required under NAGPRA, work may continue. Disposition of the remains will follow the
 4 ownership priority described in NAGPRA (25 USC Section 3002[a]).

- 5 • For federal agency undertakings, management will be coordinated through a PA and
 6 memoranda of agreement, as described above in 18.2.1.3, *Section 106 Compliance for the*
 7 *BDCP*.

8 The Bureau of Reclamation, U.S. Fish and Wildlife Service, National Marine Fisheries Service, and
 9 the U.S. Army Corps of Engineers are entering into a Programmatic Agreement with the
 10 California State Historic Preservation Officer for the implementation of NHPA Section 106 for
 11 their undertakings associated with the BDCP. The effects of Federal undertakings (actions) on
 12 historic properties (eligible for or listed on the National Register of Historic Places) will be taken
 13 into account through the implementation of this programmatic agreement.

14 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other** 15 **Conservation Measures with Plans and Policies**

16 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
 17 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
 18 resources of the Delta. A number of plans and policies that coincide with the study area provide
 19 guidance for protection of cultural resources as overviewed in Section 18.2.3, *Regional and Local*
 20 *Plans, Policies, and Regulations*. This overview of plan and policy compatibility evaluates whether
 21 Alternative 4 is compatible or incompatible with these policies, rather than whether impacts are
 22 adverse or not adverse or significant or less than significant. The physical and indirect effects of the
 23 alternatives on cultural resources are address in Impacts CUL-1 through CUL-7, as described for
 24 each alternative. The following comparison analyzes the compatibility of the BDCP with the cultural
 25 resource preservation plans and policies of the cities and counties in the region that have adopted
 26 such policies. In general, these policies fall into two categories; policies that emphasize preservation
 27 or mitigation for effects on significant cultural resources, and policies that specifically emphasize or
 28 favor preservation as the preferred management method. For policies that emphasize preservation
 29 or mitigation the BDCP will be compatible with these policies because significant cultural resources
 30 will be avoided where feasible, and mitigation will be implemented to reduce effects where
 31 avoidance and preservation is not feasible. For policies that emphasize preservation the BDCP is
 32 incompatible in some instances because multiple constraints governing the location of proposed
 33 facilities makes preservation of all significant cultural resources unlikely.

- 34 • The Alameda County East Area Plan requires that Alameda County design development to avoid
 35 cultural resources that contribute to the heritage of the County, or in the alternative to include
 36 mitigation to offset impacts to those resources (Alameda County 2000:36). Because the BDCP
 37 includes mitigation measures requiring identification of cultural resources, evaluation for the
 38 CRHR and NRHP, and mitigation to reduce unavoidable effects, the BDCP would be compatible
 39 with this policy.
- 40 • The Contra Costa County General Plan encourages identification and preservation of important
 41 cultural resources, preferably in public ownership. While other general plans and policies
 42 typically encourage preservation or mitigation, the Contra Costa County General Plan
 43 emphasizes preservation (Contra Costa County 2005: 9-11). While the BDCP will require
 44 identification, evaluation, and mitigation to the extent feasible, the preservation of all affected

1 cultural resources is infeasible because conflicting constraints such as the location of other
 2 significant environmental resources make such avoidance unlikely in every instance. For this
 3 reason, the BDCP is not compatible with the Contra Costa County General Plan.

- 4 ● San Joaquin County has adopted cultural resource protection policies as part of their general
 5 plan (San Joaquin County 1992:VI-37). These policies require identification of cultural resources
 6 prior to construction where feasible, and assessment of resources identified during construction
 7 so that appropriate mitigation may be implemented. The BDCP would be compatible with these
 8 policies because cultural resource inventories are in progress for the BDCP, and this section
 9 identifies mitigation measures and consultation that will be conducted to manage effects on
 10 cultural resources.
- 11 ● The Sacramento County General Plan includes policies encouraging preservation of important
 12 buildings, bridges, and other important structures (Sacramento County 2011:80). The General
 13 Plan requires that projects involving structures or districts of architectural importance are
 14 referred to the Cultural Resources Committee of the County to recommend appropriate
 15 mitigation. The BDCP would be potentially incompatible with these policies because the scale of
 16 the project and the constraints associated with mitigation and avoidance for other resources
 17 makes protection and avoidance of all significant architectural resources unlikely.
- 18 ● The Solano County General Plan encourages identification and preservation of important
 19 archaeological and built-environment resources (Solano County 2008:RS-43). The BDCP would
 20 be potentially incompatible with these policies because the scale of the project and the
 21 constraints associated with mitigation and avoidance for other resources makes protection and
 22 avoidance of all significant architectural resources unlikely.
- 23 ● The Yolo County General Plan requires identification of important cultural resources,
 24 consultation with Native Americans that attach significance to these resources, and avoidance or
 25 mitigation for important cultural resources affected by development (County of Yolo 2009a:CO-
 26 55 to CO-56). The General Plan also requires that permitted land uses in the Primary Zone of the
 27 Delta are consistent with the policies of the Land Use and Resource Management Plan of the
 28 Delta Protection Commission, but these policies do not have specific provisions for cultural
 29 resources. The BDCP would be compatible with these policies because cultural resource
 30 inventories are in progress for the BDCP, and this section identifies mitigation measures and
 31 consultation that will be conducted to manage effects on cultural resources.
- 32 ● The Yolo County General Plan also encourages the preservation and protection of cultural
 33 resources where feasible and consultation with Native American tribes (County of Yolo
 34 2009a:CO-55). The plan specifically encourages identification efforts, avoidance and mitigation
 35 to the maximum extent feasible, and consultation with tribes that attach significance to those
 36 resources. Because the BDCP includes mitigation measures requiring identification of cultural
 37 resources, evaluation for the CRHR and NRHP, consultation with Native American individuals
 38 and organizations, and mitigation to reduce unavoidable effects, the BDCP would be compatible
 39 with this policy.

40 It should be noted that, as described in *Land Use*, Section 13.2.3, state and federal agencies are not
 41 subject to local land use regulations. Furthermore, policy incompatibility, by itself is not a physical
 42 impact on the environment.

43 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
 44 alternatives would not result in a conflict with local land use laws.

1 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
 2 the various counties with jurisdiction in this region. For policies that emphasize preservation or
 3 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
 4 agencies will implement cultural resource management practices that will identify significant
 5 resources, preserve such resources where feasible, and complete mitigation to reduce significant
 6 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
 7 incompatible in some instances because multiple constraints governing the location of proposed
 8 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
 9 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
 10 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
 11 environment.

12 **18.3.5.10 Alternative 5—Dual Conveyance with Pipeline/Tunnel and Intake 1** 13 **(3,000 cfs; Operational Scenario C)**

14 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of** 15 **Conveyance Facilities**

16 **Identified Resources**

17 Record searches at the CHRIS and inventory efforts for the BDCP have identified five previously
 18 recorded archaeological sites in the footprint of this alternative (Appendix 18B, Table 18B-1).
 19 Detailed site descriptions summarizing available information regarding these resources, are
 20 provided in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*. Two of these sites have
 21 documented human remains.

22 The resources are distributed evenly across the alignment, but are somewhat clustered where
 23 construction of large above-ground features would occur, such as the northern end of the alignment,
 24 at the intermediate forebay, and at the southern end of the alignment.

25 **Significance of Identified Archaeological Resources**

26 The resources affected by this alternative have likely have significance and integrity within the
 27 meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

28 **Anticipated Effects on Identified Resources**

29 Ground-disturbing construction is likely to disturb the deposits and thus materially alter their
 30 ability to convey their significance. Much of the data potential in archaeological resources exists in
 31 the spatial associations of different artifacts and other cultural material. Where artifacts that have
 32 known associations with particular time periods occur adjacent to other material such as faunal
 33 bone or plant remains from subsistence activity, the proximity of the materials allows an inference
 34 as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence
 35 strategies during different prehistoric periods. Intrusive ground-disturbing construction, vibration,
 36 and other physical disturbance may disrupt these associations and thus disrupt the qualities for
 37 which the sites may qualify as historical resources or historic properties. In addition, because not all
 38 identified resources are legally accessible, these resources may be significant for other reasons than
 39 their data potential. Indirect effects such as introduction of changes to the setting associated with
 40 construction of new features or creation of new sources of noise (also a change to the setting) may
 41 diminish the basis for the significance of these resources. For these reasons, construction has the

1 potential to materially impair these resources under CEQA and to adversely affect the resources as
2 defined by Section 106 of the NHPA. This effect would be adverse.

3 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
4 damage these resources. This damage may impair the integrity of these resources and thus reduce
5 their ability to convey their significance. For these reasons this effect would be adverse.

6 **CEQA Conclusion:** Construction of conveyance facilities would affect identified five archaeological
7 resources that occur in the footprint of this alternative. DWR identified these resources and finds
8 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
9 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
10 potential to qualify as historical resources. Therefore, these sites are considered historic resources
11 for the purposes of CEQA. This impact would be significant because construction could materially
12 alter or destroy the potential of these resources to yield information useful in archaeological
13 research, the basis for the significance of these resources, through excavation and disruption of the
14 spatial associations that contain meaningful information. Identified but currently inaccessible
15 resources may also be significant under other register criteria; indirect effects such as introduction
16 of new inconsistent changes to the setting may also diminish the significance of these resources.
17 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
18 scientifically important material would be retrieved because feasible archaeological excavation only
19 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
20 important information. Construction could damage these remaining portions of the deposit.
21 Therefore, this impact is significant and unavoidable.

22 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
23 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
24 **Archaeological Sites**

25 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

26 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory**
27 **Efforts**

28 This impact is substantially similar to Impact CUL-2 described under Alternative 1A. While only one
29 intake would be constructed, slightly reducing the footprint, the overall potential for effects on
30 archaeological resources is similar.

31 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
32 resources by disrupting the spatial associations that convey data useful in research or changing the
33 setting such that the resource no longer contains its significance. The locations of various features
34 such as intakes, forebays, and tunnels shaft locations are depicted in Figure M3-1 in the mapbook
35 volume. These impacts would thus materially impair these resources within the meaning of CEQA
36 and adversely affect the resources within the meaning of Section 106 of the NHPA because this
37 disturbance would impair the ability of these resources to yield data useful in research. While
38 Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be
39 avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects
40 would remain adverse.

1 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 2 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
 3 their integrity. For these reasons this effect would be adverse.

4 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
 5 resources that cannot be identified at this time because much of the footprint is not legally
 6 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
 7 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
 8 as historical resources or unique archaeological sites under CEQA or historic properties under the
 9 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
 10 these resources by disrupting the spatial associations that could yield important data, resulting in a
 11 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
 12 guarantee that all eligible or significant resources would be preserved in place, or that all important
 13 data would be retrieved before construction destroys these resources. The scale of the BDCP,
 14 investment into existing designs, and the presence of other important environmental resources such
 15 as habitat, natural communities, and wetlands that should be avoided are constraints on the
 16 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

17 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of**
 18 **Archaeological Resources**

19 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

20 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory**
 21 **Efforts**

22 This impact is substantially similar to Impact CUL-3 described under Alternative 1A. While only one
 23 intake would be constructed, slightly reducing the footprint, the overall potential for effects on
 24 unidentified archaeological resources is similar.

25 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 26 resources by disrupting the spatial associations that convey data useful in research or changing the
 27 setting such that the resource no longer contains its significance. These impacts would thus
 28 materially impair these resources within the meaning of CEQA and adversely affect the resources
 29 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
 30 these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these
 31 effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of
 32 some resources is inevitable given the scale of the proposed construction. These effects would
 33 therefore remain adverse.

34 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 35 sites that also may not necessarily be identified prior to construction. While cultural resource
 36 inventories will be completed once legal access is secured, no inventory can ensure that all
 37 resources are identified prior to construction. Because these sites may qualify for the NRHP or
 38 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
 39 adverse.

40 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
 41 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
 42 unique archaeological resources. Because direct excavation, compaction, or other disturbance may

1 disrupt the spatial associations that contain scientifically useful information it would alter the
 2 potential basis for eligibility, thus materially altering the resource and resulting in a significant
 3 effect. Because these resources would not be identified prior to construction, they cannot be
 4 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
 5 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
 6 worker training, monitoring and discovery protocols. However, because archaeological resources
 7 may not be identified prior to disturbance through these measures, the effect cannot be entirely
 8 avoided. Therefore, this impact would remain significant and unavoidable.

9 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
 10 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

11 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

12 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

13 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
 14 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
 15 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
 16 Alternative 1A. While only one intake would be constructed, slightly reducing the footprint, the
 17 overall potential for effects on buried human remains is similar.

18 Ground-disturbing construction has the potential to damage and disinter buried human remains,
 19 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
 20 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
 21 remains adverse.

22 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 23 may occur either in isolation or as part of identified and previously unidentified archaeological
 24 resources where construction will occur. This effect would be adverse.

25 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
 26 remains. Construction would likely result in disturbance of these features. Disturbance of human
 27 remains, including remains interred outside of cemeteries is considered a significant impact in the
 28 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
 29 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
 30 significant level because mitigation would not guarantee that these features could be discovered and
 31 treated in advance of construction; the scale of construction makes it technically and economically
 32 infeasible to perform the level of sampling necessary to identify all such resources prior to
 33 construction. Therefore, this impact is considered significant and unavoidable.

34 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 35 **Such Resources Are Discovered during Construction**

36 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

37 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic**
 38 **Architectural/Built-Environment Resources Resulting from Construction Activities**

39 Built-environment resources that may be affected by this alternative include resources identified
 40 and evaluated in inventory efforts conducted for other projects and resources identified in surveys

1 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 2 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 3 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 4 18B, Table 18B-10, a total of 17 built-environment resources have the potential to be directly or
 5 indirectly affected by construction of this alternative. The specific nature and location of the impact
 6 mechanism for each affected resource is also described in Table 18B-10. The affected resources have
 7 been evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each
 8 resource is provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

9 **Discussion of Anticipated Effects on Identified and Accessible Resources**

10 As with other tunnel alternatives, construction of intakes, RTM areas, transmission lines, and other
 11 features would result in direct and indirect effects. The exact effect mechanism for each resource is
 12 described in Appendix 18B, in Table 18B-10. Facility redesign to avoid direct impacts on historic
 13 architectural resources is preferred as mitigation if possible. However, it is unlikely that all
 14 identified resources can be avoided because of the scale of the BDCP and the need to balance
 15 avoidance of other important environmental resources such as wetlands, natural communities, and
 16 special-status species habitat. These effects would materially impair the resources within the
 17 meaning of CEQA and result in adverse effects within the meaning of Section 106 because they
 18 would diminish the characteristics that convey the significance of the resources. Some direct
 19 demolition and indirect effects such as setting changes are likely to occur even with mitigation.
 20 Therefore, these effects would be adverse.

21 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
 22 built environment resources. These alterations may diminish the integrity of these resources. For
 23 these reasons this effect would be adverse.

24 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
 25 in the footprint of this alternative (17 individual resources, as described in Appendix 18B, Table
 26 18B-10). Construction of conveyance facilities may require demolition of the historic built-
 27 environment resources. These resources have been evaluated for the CRHR and qualify as historical
 28 resources under CEQA. Construction may also result in permanent indirect effects such as changes
 29 to the setting. Direct demolition or changes to the setting would be material alterations because they
 30 would either remove the resource or alter the resource character, resulting in an inability of the
 31 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
 32 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
 33 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
 34 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
 35 even with implementation of the following mitigation measures.

36 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built** 37 **Environment Treatment Plan**

38 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A

39 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic** 40 **Architectural/Built-Environment Resources Resulting from Construction Activities**

41 The footprint of this alternative is sensitive for unidentified and unevaluated built-environment
 42 resources that may have significance and integrity for the same reasons described under Alternative

1 1A. Approximately 71 unevaluated built-environment resources have been identified that may be
 2 subject to direct or indirect effects as a result of the construction of this alternative (ICF 2012, see
 3 tables of inaccessible properties and associated maps).

4 **Anticipated Effects**

5 Construction may result in direct demolition of these resources, damage through vibration, or
 6 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
 7 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
 8 guarantee that eligible resources would be avoided and that adverse changes to the setting would
 9 not occur. Construction has the potential to directly or indirectly damage built-environment
 10 resources through demolition or introduction of new inconsistent features into the setting. These
 11 changes would impair the ability of the resources to convey their significance because the character
 12 defining elements or setting of the resource would be lost. Therefore, impacts on these resources
 13 may be adverse.

14 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
 15 inaccessible and NRHP and CRHR-eligible built environment resources. These changes may diminish
 16 the integrity of these resources. For these reasons, this effect would be adverse.

17 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
 18 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
 19 efforts have not gathered complete information in these inaccessible areas. Many of these resources
 20 are likely to be associated with important historical themes or persons, or possess high creative
 21 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
 22 these resources remain intact and retain their rural agricultural setting they are also likely to have
 23 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
 24 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
 25 demolition of the historic built-environment resources. Construction may also result in permanent
 26 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
 27 material alterations because they would either remove the resource or alter the resource character,
 28 resulting in an inability of the resource to convey its significance. For these reasons this would be a
 29 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
 30 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
 31 environmental resources make avoidance of all significant effects unlikely. For these reasons this
 32 impact remains significant and unavoidable even with implementation of the following mitigation
 33 measures.

34 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess** 35 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and** 36 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

37 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

38 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

39 This impact describes the potential effects of other conservation measures at a program level of
 40 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
 41 to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources,
 42 scope of activities, and geographic area of effects are generally similar. These measures would result

1 in effects on cultural resources when ground-disturbing work is performed to construct
 2 improvements and enhance or restore natural communities. Direct effects would occur through
 3 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
 4 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment
 5 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
 6 manner that is inconsistent with the feeling and association of the resource. Because the ability of
 7 the resources to convey their significance would be lost this effect would materially alter these
 8 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural
 9 landscapes that are converted to habitat may no longer convey the themes of agriculture and
 10 settlement, and thus would be inconsistent with remaining features associated with rural historic
 11 landscapes created by reclamation, cultivation, and ranching.

12 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
 13 land included in all conservation measures that would be implemented under this alternative, it is
 14 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
 15 archaeological sites could be avoided. Therefore, this impact would be adverse.

16 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
 17 introduction of new infrastructure to the Plan Area. These physical modifications may result in
 18 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
 19 integrity of these resources. For these reasons these effects would be adverse.

20 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
 21 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
 22 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
 23 built-environment resources such as historic architectural structures and rural historic landscapes.
 24 The same construction may damage unique archaeological sites. This construction would likely
 25 result in materially adverse changes for the following reasons.

- 26 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
 27 contain data useful in research, thus diminishing or destroying the basis for the significance of
 28 the resource.
- 29 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
 30 built-environment resources, resulting in an inability of the resource to convey its significance.
- 31 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
 32 resulting in an inability of the resource to convey its significance.
- 33 ● Ground-disturbing construction may inadvertently disturb human remains.

34 The alteration of a resource that changes the characteristics that convey its significance is a material
 35 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
 36 CEQA under the Appendix G checklist. Because this construction would materially alter these
 37 categories of resources and disturb human remains it would result in a significant impact. Mitigation
 38 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
 39 where possible, and developing treatment where avoidance is not possible. In addition construction
 40 would be monitored. However, because of the acreage associated with the proposed restoration
 41 under conservation measures, as well as the multiple constraints associated with other
 42 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
 43 resources could be avoided. Therefore, this impact remains significant and unavoidable.

1 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
2 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
3 **Implementation of Conservation Measures 2–22**

4 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

5 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other**
6 **Conservation Measures with Plans and Policies**

7 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
8 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
9 resources of the Delta. A number of plans and policies that coincide with the study area provide
10 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
11 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
12 Alternative 5 is compatible or incompatible with these policies, rather than whether impacts are
13 adverse or not adverse or significant or less than significant. Because Alternative 5 would result in
14 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land
15 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
16 BDCP will be compatible with these policies because significant cultural resources will be avoided
17 where feasible, and mitigation will be implemented to reduce effects where avoidance and
18 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
19 some instances because multiple constraints governing the location of proposed facilities makes
20 preservation of all significant cultural resources unlikely. It should be noted that, as described in
21 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
22 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

23 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
24 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

25 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
26 the various counties with jurisdiction in this region. For policies that emphasize preservation or
27 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
28 agencies will implement cultural resource management practices that will identify significant
29 resources, preserve such resources where feasible, and complete mitigation to reduce significant
30 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
31 incompatible in some instances because multiple constraints governing the location of proposed
32 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
33 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
34 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
35 environment.

18.3.5.11 Alternative 6A—Isolated Conveyance with Pipeline/Tunnel and Intakes 1–5 (15,000 cfs; Operational Scenario D)

Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of Conveyance Facilities

Identified Resources

Record searches at the CHRIS and inventory efforts for the BDCP have identified seven previously recorded archaeological sites in the footprint of this alternative (Appendix 18B, Table 18B-1). Three of these sites have documented human remains. Detailed site descriptions summarizing available information regarding these resources, are provided in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*.

These seven previously recorded resources represent the known resources that occur in the footprint of this alternative. The resources are distributed evenly across the alignment, but are somewhat clustered where construction of large above-ground features would occur, such as the northern end of the alignment, at the intermediate forebay, and at the southern end of the alignment.

Significance of Identified Archaeological Resources

The resources affected by this alternative have likely have significance and integrity within the meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

Anticipated Effects on Identified Resources

Ground-disturbing construction is likely to disturb the deposits and thus materially alter their ability to convey their significance. Much of the data potential in archaeological resources exists in the spatial associations of different artifacts and other cultural material. Where artifacts that have known associations with particular time periods occur adjacent to other material such as faunal bone or plant remains from subsistence activity, the proximity of the materials allows an inference as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence strategies during different prehistoric periods. Intrusive ground-disturbing construction, vibration, and other physical disturbance may disrupt these associations and thus disrupt the qualities for which the sites may qualify as historical resources or historic properties. In addition, because not all identified resources are legally accessible, these resources may be significant for other reasons than their data potential. Indirect effects such as introduction of changes to the setting associated with construction of new features or creation of new sources of noise (also a change to the setting) may diminish the basis for the significance of these resources. For these reasons, construction has the potential to materially impair these resources under CEQA and to adversely affect the resources as defined by Section 106 of the NHPA. This effect would be adverse.

NEPA Effects: Construction may disturb NRHP and CRHR-eligible archaeological resources and damage these resources. This damage may impair the integrity of these resources and thus reduce their ability to convey their significance. For these reasons this effect would be adverse.

CEQA Conclusion: Construction of conveyance facilities would affect seven identified archaeological resources that occur in the footprint of this alternative. DWR identified these resources and finds that they are likely to qualify as historical resources under CEQA (see the individual site descriptions

1 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
 2 potential to qualify as historical resources. Therefore, these sites are considered historic resources
 3 for the purposes of CEQA. This impact would be significant because construction could materially
 4 alter or destroy the potential of these resources to yield information useful in archaeological
 5 research, the basis for the significance of these resources, through excavation and disruption of the
 6 spatial associations that contain meaningful information. Identified but currently inaccessible
 7 resources may also be significant under other register criteria; indirect effects such as introduction
 8 of new inconsistent changes to the setting may also diminish the significance of these resources.
 9 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
 10 scientifically important material would be retrieved because feasible archaeological excavation only
 11 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
 12 important information. Construction could damage these remaining portions of the deposit.
 13 Therefore, this impact is significant and unavoidable.

14 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
 15 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
 16 **Archaeological Sites**

17 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

18 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory**
 19 **Efforts**

20 This impact is substantially similar to Impact CUL-2 described under Alternative 1A. The same
 21 intakes would be constructed, and thus the overall potential for effects on archaeological resources
 22 to be identified through inventory efforts is similar.

23 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 24 resources by disrupting the spatial associations that convey data useful in research or changing the
 25 setting such that the resource no longer contains its significance. The locations of various features
 26 such as intakes, forebays, and tunnels shaft locations are depicted in Figure M3-1 in the mapbook
 27 volume. These impacts would thus materially impair these resources within the meaning of CEQA
 28 and adversely affect the resources within the meaning of Section 106 of the NHPA because this
 29 disturbance would impair the ability of these resources to yield data useful in research. While
 30 Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be
 31 avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects
 32 would remain adverse.

33 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 34 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
 35 their integrity. For these reasons this effect would be adverse.

36 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
 37 resources that cannot be identified at this time because much of the footprint is not legally
 38 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
 39 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
 40 as historical resources or unique archaeological sites under CEQA or historic properties under the
 41 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
 42 these resources by disrupting the spatial associations that could yield important data, resulting in a
 43 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot

1 guarantee that all eligible or significant resources would be preserved in place, or that all important
2 data would be retrieved before construction destroys these resources. The scale of the BDCP,
3 investment into existing designs, and the presence of other important environmental resources such
4 as habitat, natural communities, and wetlands that should be avoided are constraints on the
5 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

6 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of**
7 **Archaeological Resources**

8 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

9 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory**
10 **Efforts**

11 This impact is substantially similar to Impact CUL-3 described under Alternative 1A. The same
12 intakes would be constructed, and thus the overall potential for effects on archaeological resources
13 is similar.

14 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
15 resources by disrupting the spatial associations that convey data useful in research or changing the
16 setting such that the resource no longer contains its significance. These impacts would thus
17 materially impair these resources within the meaning of CEQA and adversely affect the resources
18 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
19 these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these
20 effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of
21 some resources is inevitable given the scale of the proposed construction. These effects would
22 therefore remain adverse.

23 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
24 sites that also may not necessarily be identified prior to construction. While cultural resource
25 inventories will be completed once legal access is secured, no inventory can ensure that all
26 resources are identified prior to construction. Because these sites may qualify for the NRHP or
27 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
28 adverse.

29 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
30 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
31 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
32 disrupt the spatial associations that contain scientifically useful information it would alter the
33 potential basis for eligibility, thus materially altering the resource and resulting in a significant
34 effect. Because these resources would not be identified prior to construction, they cannot be
35 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
36 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
37 worker training, monitoring and discovery protocols. However, because archaeological resources
38 may not be identified prior to disturbance through these measures, the effect cannot be entirely
39 avoided. Therefore, this impact would remain significant and unavoidable.

1 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
 2 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

3 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

4 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

5 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
 6 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
 7 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
 8 Alternative 1A. The same intakes would be constructed, and thus the overall potential for effects on
 9 buried human remains is similar.

10 Ground-disturbing construction has the potential to damage and disinter buried human remains,
 11 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
 12 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
 13 remains adverse.

14 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 15 may occur either in isolation or as part of identified and previously unidentified archaeological
 16 resources where construction will occur. This effect would be adverse.

17 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
 18 remains. Construction would likely result in disturbance of these features. Disturbance of human
 19 remains, including remains interred outside of cemeteries is considered a significant impact in the
 20 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
 21 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
 22 significant level because mitigation would not guarantee that these features could be discovered and
 23 treated in advance of construction; the scale of construction makes it technically and economically
 24 infeasible to perform the level of sampling necessary to identify all such resources prior to
 25 construction. Therefore, this impact is considered significant and unavoidable.

26 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 27 **Such Resources Are Discovered during Construction**

28 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

29 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic**
 30 **Architectural/Built-Environment Resources Resulting from Construction Activities**

31 Built-environment resources that may be affected by this alternative include resources identified
 32 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
 33 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 34 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 35 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 36 18B, Table 18B-11, a total of 24 built-environment resources have the potential to be directly or
 37 indirectly affected by construction of this alternative. The specific nature and location of the impact
 38 mechanism for each affected resource is also described in Table 18B-11. The affected resources have
 39 been evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each
 40 resource is provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

1 **Discussion of Anticipated Effects on Identified and Accessible Resources**

2 Direct and indirect effects would result from construction of intakes, RTM storage areas,
3 transmission lines, access roads, and other ground-disturbing features. The exact effect mechanism
4 for each resource is described in Appendix 18B, in Table 18B-11. Facility redesign to avoid direct
5 impacts on historic architectural resources is preferred as mitigation if possible. However, it is
6 unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to
7 balance avoidance of other important environmental resources such as wetlands, natural
8 communities, and special-status species habitat. These effects would materially impair the resources
9 within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because
10 they would diminish the characteristics that convey the significance of the resources. Some direct
11 demolition and indirect effects such as setting changes are likely to occur even with mitigation.
12 Therefore, these effects would be adverse.

13 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
14 built environment resources. These alterations may diminish the integrity of these resources. For
15 these reasons this effect would be adverse.

16 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
17 in the footprint of this alternative (24 individual resources, as described in Appendix 18B, Table
18 18B-11). These resources have been evaluated for the CRHR and qualify as historical resources
19 under CEQA. Construction of conveyance facilities may require demolition of the historic built-
20 environment resources. Construction may also result in permanent indirect effects such as changes
21 to the setting. Direct demolition or changes to the setting would be material alterations because they
22 would either remove the resource or alter the resource character, resulting in an inability of the
23 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
24 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
25 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
26 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
27 even with implementation of the following mitigation measures.

28 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built** 29 **Environment Treatment Plan**

30 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

31 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic** 32 **Architectural/Built-Environment Resources Resulting from Construction Activities**

33 The footprint of this alternative is sensitive for unidentified and unevaluated built-environment
34 resources that may have significance and integrity for the same reasons described under Alternative
35 1A. Approximately 71 unevaluated built-environment resources have been identified that may be
36 subject to direct or indirect effects as a result of the construction of this alternative (ICF 2012, see
37 tables of inaccessible properties and associated maps).

38 **Anticipated Effects**

39 Construction may result in direct demolition of these resources, damage through vibration, or
40 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
41 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot

1 guarantee that eligible resources would be avoided and that adverse changes to the setting would
 2 not occur. Construction has the potential to directly or indirectly damage built-environment
 3 resources through demolition or introduction of new inconsistent features into the setting. These
 4 changes would impair the ability of the resources to convey their significance because the character
 5 defining elements or setting of the resource would be lost. Therefore, impacts on these resources
 6 may be adverse.

7 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
 8 inaccessible and NRHP and CRHR-eligible built environment resources. These changes may diminish
 9 the integrity of these resources. For these reasons, this effect would be adverse.

10 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
 11 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
 12 efforts have not gathered complete information in these inaccessible areas. Many of these resources
 13 are likely to be associated with important historical themes or persons, or possess high creative
 14 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
 15 these resources remain intact and retain their rural agricultural setting they are also likely to have
 16 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
 17 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
 18 demolition of the historic built-environment resources. Construction may also result in permanent
 19 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
 20 material alterations because they would either remove the resource or alter the resource character,
 21 resulting in an inability of the resource to convey its significance. For these reasons this would be a
 22 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
 23 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
 24 environmental resources make avoidance of all significant effects unlikely. For these reasons this
 25 impact remains significant and unavoidable even with implementation of the following mitigation
 26 measures.

27 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess**
 28 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and**
 29 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

30 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

31 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

32 This impact describes the potential effects of other conservation measures at a program level of
 33 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
 34 to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources,
 35 scope of activities, and geographic area of effects are generally similar. These measures would result
 36 in effects on cultural resources when ground-disturbing work is performed to construct
 37 improvements and enhance or restore natural communities. Direct effects would occur through
 38 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
 39 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment
 40 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
 41 manner that is inconsistent with the feeling and association of the resource. Because the ability of
 42 the resources to convey their significance would be lost this effect would materially alter these
 43 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural

1 landscapes that are converted to habitat may no longer convey the themes of agriculture and
 2 settlement, and thus would be inconsistent with remaining features associated with rural historic
 3 landscapes created by reclamation, cultivation, and ranching.

4 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
 5 land included in all conservation measures that would be implemented under this alternative, it is
 6 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
 7 archaeological sites could be avoided. Therefore, this impact would be adverse.

8 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
 9 introduction of new infrastructure to the Plan Area. These physical modifications may result in
 10 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
 11 integrity of these resources. For these reasons these effects would be adverse.

12 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
 13 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
 14 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
 15 built-environment resources such as historic architectural structures and rural historic landscapes.
 16 The same construction may damage unique archaeological sites. This construction would likely
 17 result in materially adverse changes for the following reasons.

- 18 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
 19 contain data useful in research, thus diminishing or destroying the basis for the significance of
 20 the resource.
- 21 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
 22 built-environment resources, resulting in an inability of the resource to convey its significance.
- 23 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
 24 resulting in an inability of the resource to convey its significance.
- 25 ● Ground-disturbing construction may inadvertently disturb human remains.

26 The alteration of a resource that changes the characteristics that convey its significance is a material
 27 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
 28 CEQA under the Appendix G checklist. Because this construction would materially alter these
 29 categories of resources and disturb human remains it would result in a significant impact. Mitigation
 30 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
 31 where possible, and developing treatment where avoidance is not possible. In addition construction
 32 would be monitored. However, because of the acreage associated with the proposed restoration
 33 under conservation measures, as well as the multiple constraints associated with other
 34 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
 35 resources could be avoided. Therefore, this impact remains significant and unavoidable.

36 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
 37 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
 38 **Implementation of Conservation Measures 2–22**

39 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

1 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other** 2 **Conservation Measures with Plans and Policies**

3 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
4 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
5 resources of the Delta. A number of plans and policies that coincide with the study area provide
6 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
7 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
8 Alternative 6A is compatible or incompatible with these policies, rather than whether impacts are
9 adverse or not adverse or significant or less than significant. Because Alternative 6A would result in
10 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land
11 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
12 BDCP will be compatible with these policies because significant cultural resources will be avoided
13 where feasible, and mitigation will be implemented to reduce effects where avoidance and
14 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
15 some instances because multiple constraints governing the location of proposed facilities makes
16 preservation of all significant cultural resources unlikely. It should be noted that, as described in
17 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
18 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

19 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
20 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

21 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
22 the various counties with jurisdiction in this region. For policies that emphasize preservation or
23 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
24 agencies will implement cultural resource management practices that will identify significant
25 resources, preserve such resources where feasible, and complete mitigation to reduce significant
26 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
27 incompatible in some instances because multiple constraints governing the location of proposed
28 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
29 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
30 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
31 environment.

32 **18.3.5.12 Alternative 6B—Isolated Conveyance with East Alignment and** 33 **Intakes 1–5 (15,000 cfs; Operational Scenario D)**

34 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of** 35 **Conveyance Facilities**

36 **Identified Resources**

37 Record searches at the CHRIS and inventory efforts for the BDCP have identified 17 previously
38 recorded archaeological sites in the footprint of this alternative (Appendix 18B, Table 18B-1).
39 Detailed site descriptions summarizing available information regarding these resources, are
40 provided in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*. These sites are distributed
41 more heavily towards the northern and southern end of the alignment. Seven of these sites have
42 human remain documented as part of the deposit.

1 **Significance of Identified Archaeological Resources**

2 The resources affected by this alternative have likely have significance and integrity within the
3 meaning of the NRHP and CRHR for the same reasons described above under Alternative 1B.

4 **Anticipated Effects on Identified Resources**

5 Ground-disturbing construction is likely to disturb the deposits and thus materially alter their
6 ability to convey their significance. Much of the data potential in archaeological resources exists in
7 the spatial associations of different artifacts and other cultural material. Where artifacts that have
8 known associations with particular time periods occur adjacent to other material such as faunal
9 bone or plant remains from subsistence activity, the proximity of the materials allows an inference
10 as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence
11 strategies during different prehistoric periods. Intrusive ground-disturbing construction, vibration,
12 and other physical disturbance may disrupt these associations and thus disrupt the qualities for
13 which the sites may qualify as historical resources or historic properties. In addition, because not all
14 identified resources are legally accessible, these resources may be significant for other reasons than
15 their data potential. Indirect effects such as introduction of changes to the setting associated with
16 construction of new features or creation of new sources of noise (also a change to the setting) may
17 diminish the basis for the significance of these resources. For these reasons, construction has the
18 potential to materially impair these resources under CEQA and to adversely affect the resources as
19 defined by Section 106 of the NHPA. This effect would be adverse.

20 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
21 damage these resources. This damage may impair the integrity of these resources and thus reduce
22 their ability to convey their significance. For these reasons this effect would be adverse.

23 **CEQA Conclusion:** Construction of conveyance facilities would affect 17 identified archaeological
24 resources that occur in the footprint of this alternative. DWR identified these resources and finds
25 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
26 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
27 potential to qualify as historical resources. Therefore, these sites are considered historic resources
28 for the purposes of CEQA. This impact would be significant because construction could materially
29 alter or destroy the potential of these resources to yield information useful in archaeological
30 research, the basis for the significance of these resources, through excavation and disruption of the
31 spatial associations that contain meaningful information. Identified but currently inaccessible
32 resources may also be significant under other register criteria; indirect effects such as introduction
33 of new inconsistent changes to the setting may also diminish the significance of these resources.
34 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
35 scientifically important material would be retrieved because feasible archaeological excavation only
36 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
37 important information. Construction could damage these remaining portions of the deposit.
38 Therefore, this impact is significant and unavoidable.

39 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery** 40 **Excavations on the Affected Portion of the Deposits of Identified and Significant** 41 **Archaeological Sites**

42 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

1 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory** 2 **Efforts**

3 This impact is generally similar to Impact CUL-2 described under Alternative 1B. This alternative is
4 sensitive for previously unidentified archaeological resources that are likely to be significant and to
5 have integrity for the same reasons as described under Alternative 1B. It should be noted however,
6 that the eastern canal would cross more sensitive soil formations and result in continuous ground-
7 disturbance that may have a slightly greater potential to affect prehistoric archaeological resources
8 compared to Alternative 1B and Alternative 1C. Figure 1 in Appendix 18A depicts the eastern canal
9 relative to archaeologically sensitive soil formations. The general sensitivity for historic-era
10 archaeological resources is similar to Alternative 1B.

11 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
12 resources by disrupting the spatial associations that convey data useful in research or changing the
13 setting such that the resource no longer contains its significance. These impacts would thus
14 materially impair these resources within the meaning of CEQA and adversely affect the resources
15 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
16 these resources to yield data useful in research. The locations of ground-disturbing features such as
17 the canal, access roads, pumping plants, borrow areas and concrete batch plants are depicted in
18 Figure M3-2 in the mapbook volume. While Mitigation Measure CUL-2 would reduce these effects, it
19 cannot guarantee all effects would be avoided because relocation of proposed facilities to avoid all
20 resources is unlikely. These effects would remain adverse.

21 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
22 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
23 their integrity. For these reasons this effect would be adverse.

24 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
25 resources that cannot be identified at this time because much of the footprint is not legally
26 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
27 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
28 as historical resources or unique archaeological sites under CEQA or historic properties under the
29 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
30 these resources by disrupting the spatial associations that could yield important data, resulting in a
31 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
32 guarantee that all eligible or significant resources would be preserved in place, or that all important
33 data would be retrieved before construction destroys these resources. The scale of the BDCP,
34 investment into existing designs, and the presence of other important environmental resources such
35 as habitat, natural communities, and wetlands that should be avoided are constraints on the
36 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

37 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of** 38 **Archaeological Resources**

39 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

1 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory** 2 **Efforts**

3 Appendix 18A, *Archaeological Resources Sensitivity Assessment*, presents an overview of the
4 sensitivity of the Plan Area for previously unidentified archaeological resources and demonstrates
5 that additional prehistoric and historic-era sites that have not yet been identified are almost certain
6 to occur in the portion of the Plan Area where this alternative would be constructed. This sensitivity
7 and the potential impact mechanisms are substantially similar to the sensitivity and impact
8 mechanism described for Alternative 1B. It should be noted however, that the eastern canal would
9 cross more sensitive soil formations and result in continuous ground-disturbance that may have a
10 slightly greater potential to affect prehistoric archaeological resources compared to Alternative 1A
11 and Alternative 1C. Figure 1 in Appendix 18A depicts the eastern canal relative to archaeologically
12 sensitive soil formations. The general sensitivity for historic-era archaeological resources is similar
13 to Alternative 1A.

14 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
15 resources by disrupting the spatial associations that convey data useful in research or changing the
16 setting such that the resource no longer contains its significance. These impacts would thus
17 materially impair these resources within the meaning of CEQA and adversely affect the resources
18 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
19 these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these
20 effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of
21 some resources is inevitable given the scale of the proposed construction. These effects would
22 therefore remain adverse.

23 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
24 sites that also may not necessarily be identified prior to construction. While cultural resource
25 inventories will be completed once legal access is secured, no inventory can ensure that all
26 resources are identified prior to construction. Because these sites may qualify for the NRHP or
27 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
28 adverse.

29 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
30 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
31 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
32 disrupt the spatial associations that contain scientifically useful information it would alter the
33 potential basis for eligibility, thus materially altering the resource and resulting in a significant
34 effect. Because these resources would not be identified prior to construction, they cannot be
35 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
36 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
37 worker training, monitoring and discovery protocols. However, because archaeological resources
38 may not be identified prior to disturbance through these measures, the effect cannot be entirely
39 avoided. Therefore, this impact would remain significant and unavoidable.

40 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,** 41 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

42 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

1 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

2 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
3 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
4 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
5 Alternative 1B. However, because the eastern canal crosses more sensitive soil formations and may
6 result in greater continuous ground disturbance than 1A and Alternative 1C, the potential for
7 impacts on buried human remains may be slightly higher than described for Alternative 1A and 1C.

8 Ground-disturbing construction has the potential to damage and disinter buried human remains,
9 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
10 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
11 remains adverse.

12 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
13 may occur either in isolation or as part of identified and previously unidentified archaeological
14 resources where construction will occur. This effect would be adverse.

15 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
16 remains. Construction would likely result in disturbance of these features. Disturbance of human
17 remains, including remains interred outside of cemeteries is considered a significant impact in the
18 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
19 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
20 significant level because mitigation would not guarantee that these features could be discovered and
21 treated in advance of construction; the scale of construction makes it technically and economically
22 infeasible to perform the level of sampling necessary to identify all such resources prior to
23 construction. Therefore, this impact is considered significant and unavoidable.

24 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if** 25 **Such Resources Are Discovered during Construction**

26 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

27 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic** 28 **Architectural/Built-Environment Resources Resulting from Construction Activities**

29 Built-environment resources that may be affected by this alternative include resources identified
30 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
31 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
32 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
33 similar reasons some are considered historical resources under CEQA. As identified in Appendix
34 18B, Table 18B-12, a total of 23 built-environment resources have the potential to be directly or
35 indirectly affected by construction of this alternative. The specific nature of the impact mechanism
36 for each affected resource is also described in Table 18B-12. The affected resources have been
37 evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each resource is
38 provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

39 **Discussion of Anticipated Effects on Identified and Accessible Resources**

40 Direct and indirect effects on identified and eligible resources will result from construction of
41 intakes, RTM storage areas, the canal itself, and transmission lines. The exact effect mechanism for

1 each resource is described in Appendix 18B, in Table 18B-12. Facility redesign to avoid direct
 2 impacts on historic architectural resources is preferred as mitigation if possible. However, it is
 3 unlikely that all identified resources can be avoided because of the scale of the BDCP and the need to
 4 balance avoidance of other important environmental resources such as wetlands, natural
 5 communities, and special-status species habitat. These effects would materially impair the resources
 6 within the meaning of CEQA and result in adverse effects within the meaning of Section 106 because
 7 they would diminish the characteristics that convey the significance of the resources. Some direct
 8 demolition and indirect effects such as setting changes are likely to occur even with mitigation.
 9 Therefore, these effects would be adverse.

10 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
 11 built environment resources. These alterations may diminish the integrity of these resources. For
 12 these reasons this effect would be adverse.

13 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
 14 in the footprint of this alternative (23 individual resources, as described in Appendix 18B, Table
 15 18B-12). These resources have been evaluated for the CRHR and qualify as historical resources
 16 under CEQA. Construction of conveyance facilities may require demolition of the historic built-
 17 environment resources. Construction may also result in permanent indirect effects such as changes
 18 to the setting. Direct demolition or changes to the setting would be material alterations because they
 19 would either remove the resource or alter the resource character, resulting in an inability of the
 20 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
 21 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
 22 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
 23 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
 24 even with implementation of the following mitigation measures.

25 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built**
 26 **Environment Treatment Plan**

27 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

28 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic**
 29 **Architectural/Built-Environment Resources Resulting from Construction Activities**

30 The footprint of this alternative is sensitive for unidentified and unevaluated built-environment
 31 resources that may have significance and integrity for the same reasons described under Alternative
 32 1B. Approximately 67 unevaluated built-environment resources have been identified that may be
 33 subject to direct or indirect effects as a result of the construction of this alternative (ICF 2012, see
 34 tables of inaccessible properties and associated maps).

35 **Anticipated Effects**

36 Construction may result in direct demolition of these resources, damage through vibration, or
 37 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
 38 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
 39 guarantee that eligible resources would be avoided and that adverse changes to the setting would
 40 not occur. Construction has the potential to directly or indirectly damage built-environment
 41 resources through demolition or introduction of new inconsistent features into the setting. These
 42 changes would impair the ability of the resources to convey their significance because the character

1 defining elements or setting of the resource would be lost, resulting in a materially adverse change
2 and adverse effect. Therefore, impacts on these resources may be adverse.

3 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
4 inaccessible and NRHP and CRHR-eligible built environment resources. These changes may diminish
5 the integrity of these resources. For these reasons, this effect would be adverse.

6 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
7 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
8 efforts have not gathered complete information in these inaccessible areas. Many of these resources
9 are likely to be associated with important historical themes or persons, or possess high creative
10 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
11 these resources remain intact and retain their rural agricultural setting they are also likely to have
12 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
13 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
14 demolition of the historic built-environment resources. Construction may also result in permanent
15 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
16 material alterations because they would either remove the resource or alter the resource character,
17 resulting in an inability of the resource to convey its significance. For these reasons this would be a
18 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
19 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
20 environmental resources make avoidance of all significant effects unlikely. For these reasons this
21 impact remains significant and unavoidable even with implementation of the following mitigation
22 measures.

23 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess**
24 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and**
25 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

26 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

27 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

28 This impact describes the potential effects of other conservation measures at a program level of
29 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
30 to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources,
31 scope of activities, and geographic area of effects are generally similar. These measures would result
32 in effects on cultural resources when ground-disturbing work is performed to construct
33 improvements and enhance or restore natural communities. Direct effects would occur through
34 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
35 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment
36 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
37 manner that is inconsistent with the feeling and association of the resource. Because the ability of
38 the resources to convey their significance would be lost this effect would materially alter these
39 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural
40 landscapes that are converted to habitat may no longer convey the themes of agriculture and
41 settlement, and thus would be inconsistent with remaining features associated with rural historic
42 landscapes created by reclamation, cultivation, and ranching.

1 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
 2 land included in all conservation measures that would be implemented under this alternative, it is
 3 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
 4 archaeological sites could be avoided. Therefore, this impact would be adverse.

5 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
 6 introduction of new infrastructure to the Plan Area. These physical modifications may result in
 7 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
 8 integrity of these resources. For these reasons these effects would be adverse.

9 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
 10 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
 11 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
 12 built-environment resources such as historic architectural structures and rural historic landscapes.
 13 The same construction may damage unique archaeological sites. This construction would likely
 14 result in materially adverse changes for the following reasons.

- 15 • Ground-disturbing construction in archaeological sites disrupts the spatial associations that
 16 contain data useful in research, thus diminishing or destroying the basis for the significance of
 17 the resource.
- 18 • Ground-disturbing construction may either directly demolish or indirectly affect the setting of
 19 built-environment resources, resulting in an inability of the resource to convey its significance.
- 20 • Ground-disturbing construction may either directly demolish or change the setting of TCPs
 21 resulting in an inability of the resource to convey its significance.
- 22 • Ground-disturbing construction may inadvertently disturb human remains.

23 The alteration of a resource that changes the characteristics that convey its significance is a material
 24 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
 25 CEQA under the Appendix G checklist. Because this construction would materially alter these
 26 categories of resources and disturb human remains it would result in a significant impact. Mitigation
 27 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
 28 where possible, and developing treatment where avoidance is not possible. In addition construction
 29 would be monitored. However, because of the acreage associated with the proposed restoration
 30 under conservation measures, as well as the multiple constraints associated with other
 31 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
 32 resources could be avoided. Therefore, this impact remains significant and unavoidable.

33 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
 34 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
 35 **Implementation of Conservation Measures 2-22**

36 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

37 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other**
 38 **Conservation Measures with Plans and Policies**

39 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
 40 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
 41 resources of the Delta. A number of plans and policies that coincide with the study area provide

1 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
 2 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
 3 Alternative 6B is compatible or incompatible with these policies, rather than whether impacts are
 4 adverse or not adverse or significant or less than significant. Because Alternative 6B would result in
 5 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land
 6 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
 7 BDCP will be compatible with these policies because significant cultural resources will be avoided
 8 where feasible, and mitigation will be implemented to reduce effects where avoidance and
 9 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
 10 some instances because multiple constraints governing the location of proposed facilities makes
 11 preservation of all significant cultural resources unlikely. It should be noted that, as described in
 12 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
 13 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

14 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
 15 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

16 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
 17 the various counties with jurisdiction in this region. For policies that emphasize preservation or
 18 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
 19 agencies will implement cultural resource management practices that will identify significant
 20 resources, preserve such resources where feasible, and complete mitigation to reduce significant
 21 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
 22 incompatible in some instances because multiple constraints governing the location of proposed
 23 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
 24 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
 25 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
 26 environment.

27 **18.3.5.13 Alternative 6C—Isolated Conveyance with West Alignment and** 28 **Intakes W1–W5 (15,000 cfs; Operational Scenario D)**

29 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of** 30 **Conveyance Facilities**

31 **Identified Resources**

32 Record searches at the CHRIS and inventory efforts for the BDCP have identified 12 previously
 33 recorded archaeological sites in the footprint of this alternative as described in Appendix 18B, Table
 34 18B-1 (only 11 are potentially register eligible). Detailed site descriptions summarizing available
 35 information regarding these resources, are provided in Appendix 18B, Section B.1.2 *Archaeological*
 36 *Site Descriptions*.

37 These sites are distributed more heavily towards the northern and southern end of the alignment
 38 where ground-disturbing effects of the western canal are concentrated.

39 **Significance of Identified Archaeological Resources**

40 The resources affected by this alternative have likely have significance and integrity within the
 41 meaning of the NRHP and CRHR for the same reasons described above under Alternative 1C. CA-Yol-

1 165H does not have sufficient integrity to convey significance and therefore does not qualify as an
2 historical resource or historic property.

3 **Anticipated Effects on Identified Resources**

4 Ground-disturbing construction is likely to disturb the deposits and thus materially alter their
5 ability to convey their significance. Much of the data potential in archaeological resources exists in
6 the spatial associations of different artifacts and other cultural material. Where artifacts that have
7 known associations with particular time periods occur adjacent to other material such as faunal
8 bone or plant remains from subsistence activity, the proximity of the materials allows an inference
9 as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence
10 strategies during different prehistoric periods. Intrusive ground-disturbing construction, vibration,
11 and other physical disturbance may disrupt these associations and thus disrupt the qualities for
12 which the sites may qualify as historical resources or historic properties. In addition, because not all
13 identified resources are legally accessible, these resources may be significant for other reasons than
14 their data potential. Indirect effects such as introduction of changes to the setting associated with
15 construction of new features or creation of new sources of noise (also a change to the setting) may
16 diminish the basis for the significance of these resources. For these reasons, construction has the
17 potential to materially impair these resources under CEQA and to adversely affect the resources as
18 defined by Section 106 of the NHPA. This effect would be adverse.

19 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
20 damage these resources. This damage may impair the integrity of these resources and thus reduce
21 their ability to convey their significance. For these reasons this effect would be adverse.

22 **CEQA Conclusion:** Construction of conveyance facilities would affect 12 identified archaeological
23 resources that occur in the footprint of this alternative. DWR identified these resources and finds
24 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
25 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
26 potential to qualify as historical resources. Therefore, these sites are considered historic resources
27 for the purposes of CEQA. This impact would be significant because construction could materially
28 alter or destroy the potential of these resources to yield information useful in archaeological
29 research, the basis for the significance of these resources, through excavation and disruption of the
30 spatial associations that contain meaningful information. Identified but currently inaccessible
31 resources may also be significant under other register criteria; indirect effects such as introduction
32 of new inconsistent changes to the setting may also diminish the significance of these resources.
33 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
34 scientifically important material would be retrieved because feasible archaeological excavation only
35 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
36 important information. Construction could damage these remaining portions of the deposit.
37 Therefore, this impact is significant and unavoidable.

38 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery** 39 **Excavations on the Affected Portion of the Deposits of Identified and Significant** 40 **Archaeological Sites**

41 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

1 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory** 2 **Efforts**

3 This impact is generally similar to Impact CUL-2 described under Alternative 1C. This alternative is
4 sensitive for previously unidentified archaeological resources that are likely to be significant and to
5 have integrity for the same reasons as described under Alternative 1C. It should be noted however,
6 that the western canal would cross more sensitive soil formations along the northern and southern
7 ends of the alignment compared to Alternative 1A and the eastern canal. The middle segment of this
8 alternative would make use of a subterranean tunnel that crosses low-sensitivity soil units. While
9 this alternative is thus sensitive for archaeological sites, it should be noted that the eastern canal
10 options would result in the construction of more structures and thus have even greater potential to
11 affect archaeological resources. Figure 1 in Appendix 18A depicts the western canal relative to
12 archaeologically sensitive soil formations. The general sensitivity for historic-era archaeological
13 resources is similar to Alternative 1A.

14 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
15 resources by disrupting the spatial associations that convey data useful in research or changing the
16 setting such that the resource no longer contains its significance. The location of ground-disturbing
17 features such as intakes, the canal, tunnel segment, and borrow areas are depicted in Figure M3-3 in
18 the mapbook volume. These impacts would thus materially impair these resources within the
19 meaning of CEQA and adversely affect the resources within the meaning of Section 106 of the NHPA
20 because this disturbance would impair the ability of these resources to yield data useful in research.
21 While Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be
22 avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects
23 would remain adverse.

24 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
25 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
26 their integrity. For these reasons this effect would be adverse.

27 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
28 resources that cannot be identified at this time because much of the footprint is not legally
29 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
30 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
31 as historical resources or unique archaeological sites under CEQA or historic properties under the
32 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
33 these resources by disrupting the spatial associations that could yield important data, resulting in a
34 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
35 guarantee that all eligible or significant resources would be preserved in place, or that all important
36 data would be retrieved before construction destroys these resources. The scale of the BDCP,
37 investment into existing designs, and the presence of other important environmental resources such
38 as habitat, natural communities, and wetlands that should be avoided are constraints on the
39 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

40 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of** 41 **Archaeological Resources**

42 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

1 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory** 2 **Efforts**

3 Appendix 18A, *Archaeological Resources Sensitivity Assessment*, presents an overview of the
4 sensitivity of the Plan Area for previously unidentified archaeological resources and demonstrates
5 that additional prehistoric and historic-era sites that have not yet been identified are almost certain
6 to occur in the portion of the Plan Area where this alternative would be constructed. This sensitivity
7 and the potential impact mechanisms are substantially similar to the sensitivity and impact
8 mechanism described for Alternative 1C. It should be noted however, that the western canal would
9 cross more sensitive soil formations along the northern and southern ends of the alignment
10 compared to the tunnel and eastern canal. The middle segment of this alternative would make use of
11 a subterranean tunnel that crosses low-sensitivity soil units. The overall sensitivity for prehistoric
12 archaeological resources may be slightly higher than the tunnel, but slightly lower than the eastern
13 canal, because of the relative proportion of high sensitivity geological formations. Figure 1 in
14 Appendix 18A depicts the western canal relative to archaeologically sensitive soil formations. The
15 general sensitivity for historic-era archaeological resources is similar to the tunnel and eastern
16 canal.

17 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
18 resources by disrupting the spatial associations that convey data useful in research or changing the
19 setting such that the resource no longer contains its significance. These impacts would thus
20 materially impair these resources within the meaning of CEQA and adversely affect the resources
21 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
22 these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these
23 effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of
24 some resources is inevitable given the scale of the proposed construction. These effects would
25 therefore remain adverse.

26 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
27 sites that also may not necessarily be identified prior to construction. While cultural resource
28 inventories will be completed once legal access is secured, no inventory can ensure that all
29 resources are identified prior to construction. Because these sites may qualify for the NRHP or
30 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
31 adverse.

32 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
33 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
34 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
35 disrupt the spatial associations that contain scientifically useful information it would alter the
36 potential basis for eligibility, thus materially altering the resource and resulting in a significant
37 effect. Because these resources would not be identified prior to construction, they cannot be
38 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
39 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
40 worker training, monitoring and discovery protocols. However, because archaeological resources
41 may not be identified prior to disturbance through these measures, the effect cannot be entirely
42 avoided. Therefore, this impact would remain significant and unavoidable.

1 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
 2 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

3 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

4 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

5 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
 6 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
 7 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
 8 Alternative 1C. However, because the western canal crosses more sensitive soil formations and may
 9 result in greater continuous ground disturbance than the tunnel option, the potential for impacts on
 10 buried human remains may be slightly higher than described for the tunnel option. Based on the
 11 relative proportion of geologically sensitive map units, the western canal may be slightly lower in
 12 sensitivity for buried human remains compared to the eastern canal.

13 Ground-disturbing construction has the potential to damage and disinter buried human remains,
 14 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
 15 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
 16 remains adverse.

17 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 18 may occur either in isolation or as part of identified and previously unidentified archaeological
 19 resources where construction will occur. This effect would be adverse.

20 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
 21 remains. Construction would likely result in disturbance of these features. Disturbance of human
 22 remains, including remains interred outside of cemeteries is considered a significant impact in the
 23 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
 24 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
 25 significant level because mitigation would not guarantee that these features could be discovered and
 26 treated in advance of construction; the scale of construction makes it technically and economically
 27 infeasible to perform the level of sampling necessary to identify all such resources prior to
 28 construction. Therefore, this impact is considered significant and unavoidable.

29 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 30 **Such Resources Are Discovered during Construction**

31 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

32 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic**
 33 **Architectural/Built-Environment Resources Resulting from Construction Activities**

34 Built-environment resources that may be affected by this alternative include resources identified
 35 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
 36 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 37 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 38 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 39 18B, Table 18B-13, a total of 22 built-environment resources have the potential to be directly or
 40 indirectly affected by construction of this alternative. The specific nature of the impact mechanism
 41 for each affected resource is also described in Table 18B-13. The affected resources have been

1 evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each resource is
2 provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

3 **Discussion of Anticipated Effects on Identified and Accessible Resources**

4 Construction of intakes, transmission lines, the canal itself, and other ground-disturbing features
5 will result in direct and indirect effects on identified and eligible built-environment resources. The
6 exact effect mechanism for each resource is described in Appendix 18B, in Table 18B-13. Facility
7 redesign to avoid direct impacts on historic architectural resources is preferred as mitigation if
8 possible. However, it is unlikely that all identified resources can be avoided because of the scale of
9 the BDCP and the need to balance avoidance of other important environmental resources such as
10 wetlands, natural communities, and special-status species habitat. These effects would materially
11 impair the resources within the meaning of CEQA and result in adverse effects within the meaning of
12 Section 106 because they would diminish the characteristics that convey the significance of the
13 resources. Some direct demolition and indirect effects such as setting changes are likely to occur
14 even with mitigation. Therefore, these effects would be adverse.

15 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
16 built environment resources. These alterations may diminish the integrity of these resources. For
17 these reasons this effect would be adverse.

18 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
19 in the footprint of this alternative (22 individual resources, as described in Appendix 18B, Table
20 18B-13). These resources have been evaluated for the CRHR and qualify as historical resources
21 under CEQA. Construction of conveyance facilities may require demolition of the historic built-
22 environment resources. Construction may also result in permanent indirect effects such as changes
23 to the setting. Direct demolition or changes to the setting would be material alterations because they
24 would either remove the resource or alter the resource character, resulting in an inability of the
25 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
26 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
27 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
28 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
29 even with implementation of the following mitigation measures.

30 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built** 31 **Environment Treatment Plan**

32 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

33 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic** 34 **Architectural/Built-Environment Resources Resulting from Construction Activities**

35 The footprint of this alternative is sensitive for unidentified and unevaluated built-environment
36 resources that may have significance and integrity for the same reasons described under Alternative
37 1C. Approximately 74 unevaluated built-environment resources have been identified that may be
38 subject to direct or indirect effects as a result of the construction of this alternative (ICF 2012, see
39 tables of inaccessible properties and associated maps).

1 Anticipated Effects

2 Construction may result in direct demolition of these resources, damage through vibration, or
 3 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
 4 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
 5 guarantee that eligible resources would be avoided and that adverse changes to the setting would
 6 not occur. Construction has the potential to directly or indirectly damage built-environment
 7 resources through demolition or introduction of new inconsistent features into the setting. These
 8 changes would impair the ability of the resources to convey their significance because the character
 9 defining elements or setting of the resource would be lost. Therefore, impacts on these resources
 10 may be adverse.

11 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
 12 inaccessible and NRHP and CRHR-eligible built environment resources. These changes may diminish
 13 the integrity of these resources. For these reasons, this effect would be adverse.

14 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
 15 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
 16 efforts have not gathered complete information in these inaccessible areas. Many of these resources
 17 are likely to be associated with important historical themes or persons, or possess high creative
 18 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
 19 these resources remain intact and retain their rural agricultural setting they are also likely to have
 20 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
 21 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
 22 demolition of the historic built-environment resources. Construction may also result in permanent
 23 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
 24 material alterations because they would either remove the resource or alter the resource character,
 25 resulting in an inability of the resource to convey its significance. For these reasons this would be a
 26 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
 27 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
 28 environmental resources make avoidance of all significant effects unlikely. For these reasons this
 29 impact remains significant and unavoidable even with implementation of the following mitigation
 30 measures.

31 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess** 32 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and** 33 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

34 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

35 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

36 This impact describes the potential effects of other conservation measures at a program level of
 37 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
 38 to Impact CUL-7 as discussed under Alternative 1C because the nature of the affected resources,
 39 scope of activities, and geographic area of effects are generally similar. These measures would result
 40 in effects on cultural resources when ground-disturbing work is performed to construct
 41 improvements and enhance or restore natural communities. Direct effects would occur through
 42 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
 43 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment

1 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
 2 manner that is inconsistent with the feeling and association of the resource. Because the ability of
 3 the resources to convey their significance would be lost this effect would materially alter these
 4 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural
 5 landscapes that are converted to habitat may no longer convey the themes of agriculture and
 6 settlement, and thus would be inconsistent with remaining features associated with rural historic
 7 landscapes created by reclamation, cultivation, and ranching.

8 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
 9 land included in all conservation measures that would be implemented under this alternative, it is
 10 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
 11 archaeological sites could be avoided. Therefore, this impact would be adverse.

12 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
 13 introduction of new infrastructure to the Plan Area. These physical modifications may result in
 14 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
 15 integrity of these resources. For these reasons these effects would be adverse.

16 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
 17 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
 18 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
 19 built-environment resources such as historic architectural structures and rural historic landscapes.
 20 The same construction may damage unique archaeological sites. This construction would likely
 21 result in materially adverse changes for the following reasons:

- 22 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
 23 contain data useful in research, thus diminishing or destroying the basis for the significance of
 24 the resource.
- 25 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
 26 built-environment resources, resulting in an inability of the resource to convey its significance.
- 27 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
 28 resulting in an inability of the resource to convey its significance.
- 29 ● Ground-disturbing construction may inadvertently disturb human remains.

30 The alteration of a resource that changes the characteristics that convey its significance is a material
 31 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
 32 CEQA under the Appendix G checklist. Because this construction would materially alter these
 33 categories of resources and disturb human remains it would result in a significant impact. Mitigation
 34 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
 35 where possible, and developing treatment where avoidance is not possible. In addition construction
 36 would be monitored. However, because of the acreage associated with the proposed restoration
 37 under conservation measures, as well as the multiple constraints associated with other
 38 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
 39 resources could be avoided. Therefore, this impact remains significant and unavoidable.

1 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
2 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
3 **Implementation of Conservation Measures 2–22**

4 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

5 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other**
6 **Conservation Measures with Plans and Policies**

7 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
8 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
9 resources of the Delta. A number of plans and policies that coincide with the study area provide
10 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
11 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
12 Alternative 6C is compatible or incompatible with these policies, rather than whether impacts are
13 adverse or not adverse or significant or less than significant. Because Alternative 6C would result in
14 the same kinds of effects as Alternative 1C, this alternative is only compatible with some of the land
15 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
16 BDCP will be compatible with these policies because significant cultural resources will be avoided
17 where feasible, and mitigation will be implemented to reduce effects where avoidance and
18 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
19 some instances because multiple constraints governing the location of proposed facilities makes
20 preservation of all significant cultural resources unlikely. It should be noted that, as described in
21 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
22 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

23 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
24 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

25 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
26 the various counties with jurisdiction in this region. For policies that emphasize preservation or
27 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
28 agencies will implement cultural resource management practices that will identify significant
29 resources, preserve such resources where feasible, and complete mitigation to reduce significant
30 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
31 incompatible in some instances because multiple constraints governing the location of proposed
32 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
33 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
34 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
35 environment.

1 **18.3.5.14 Alternative 7—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3,**
 2 **and 5, and Enhanced Aquatic Conservation (9,000 cfs; Operational**
 3 **Scenario E)**

4 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of**
 5 **Conveyance Facilities**

6 **Identified Resources**

7 Record searches at the CHRIS and inventory efforts for the BDCP have identified six previously
 8 recorded prehistoric archaeological sites in the footprint of this alternative (Appendix 18B, Table
 9 18B-1). Detailed site descriptions summarizing available information regarding these resources, are
 10 provided in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*. Two of these sites have
 11 human remains documented as part of the deposit.

12 The resources are distributed evenly across the alignment, but are somewhat clustered where
 13 construction of large above-ground features would occur, such as the northern end of the alignment,
 14 at the intermediate forebay, and at the southern end of the alignment.

15 **Significance of Identified Archaeological Resources**

16 The resources affected by this alternative have likely have significance and integrity within the
 17 meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

18 **Anticipated Effects on Identified Resources**

19 Ground-disturbing construction is likely to disturb the deposits and thus materially alter their
 20 ability to convey their significance. Much of the data potential in archaeological resources exists in
 21 the spatial associations of different artifacts and other cultural material. Where artifacts that have
 22 known associations with particular time periods occur adjacent to other material such as faunal
 23 bone or plant remains from subsistence activity, the proximity of the materials allows an inference
 24 as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence
 25 strategies during different prehistoric periods. Intrusive ground-disturbing construction, vibration,
 26 and other physical disturbance may disrupt these associations and thus disrupt the qualities for
 27 which the sites may qualify as historical resources or historic properties. In addition, because not all
 28 identified resources are legally accessible, these resources may be significant for other reasons than
 29 their data potential. Indirect effects such as introduction of changes to the setting associated with
 30 construction of new features or creation of new sources of noise (also a change to the setting) may
 31 diminish the basis for the significance of these resources. For these reasons, construction has the
 32 potential to materially impair these resources under CEQA and to adversely affect the resources as
 33 defined by Section 106 of the NHPA. This effect would be adverse.

34 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
 35 damage these resources. This damage may impair the integrity of these resources and thus reduce
 36 their ability to convey their significance. For these reasons this effect would be adverse.

37 **CEQA Conclusion:** Construction of conveyance facilities would affect six identified archaeological
 38 resources that occur in the footprint of this alternative. DWR identified these resources and finds
 39 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
 40 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the

1 potential to qualify as historical resources. Therefore, these sites are considered historic resources
 2 for the purposes of CEQA. This impact would be significant because construction could materially
 3 alter or destroy the potential of these resources to yield information useful in archaeological
 4 research, the basis for the significance of these resources, through excavation and disruption of the
 5 spatial associations that contain meaningful information. Identified but currently inaccessible
 6 resources may also be significant under other register criteria; indirect effects such as introduction
 7 of new inconsistent changes to the setting may also diminish the significance of these resources.
 8 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
 9 scientifically important material would be retrieved because feasible archaeological excavation only
 10 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
 11 important information. Construction could damage these remaining portions of the deposit.
 12 Therefore, this impact is significant and unavoidable.

13 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
 14 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
 15 **Archaeological Sites**

16 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

17 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory**
 18 **Efforts**

19 This impact is substantially similar to Impact CUL-2 described under Alternative 1A. While the
 20 intake locations would be reduced to three facilities, slightly reducing the potential for effects on
 21 archaeological resources, the overall potential for effects on archaeological resources is similar.

22 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 23 resources by disrupting the spatial associations that convey data useful in research or changing the
 24 setting such that the resource no longer contains its significance. The locations of various features
 25 such as intakes, forebays, and tunnels shaft locations are depicted in Figure M3-1 in the mapbook
 26 volume. These impacts would thus materially impair these resources within the meaning of CEQA
 27 and adversely affect the resources within the meaning of Section 106 of the NHPA because this
 28 disturbance would impair the ability of these resources to yield data useful in research. While
 29 Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be
 30 avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects
 31 would remain adverse.

32 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 33 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
 34 their integrity. For these reasons this effect would be adverse.

35 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
 36 resources that cannot be identified at this time because much of the footprint is not legally
 37 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
 38 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
 39 as historical resources or unique archaeological sites under CEQA or historic properties under the
 40 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
 41 these resources by disrupting the spatial associations that could yield important data, resulting in a
 42 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
 43 guarantee that all eligible or significant resources would be preserved in place, or that all important

1 data would be retrieved before construction destroys these resources. The scale of the BDCP,
2 investment into existing designs, and the presence of other important environmental resources such
3 as habitat, natural communities, and wetlands that should be avoided are constraints on the
4 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

5 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of**
6 **Archaeological Resources**

7 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

8 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory**
9 **Efforts**

10 This impact is substantially similar to Impact CUL-3 described under Alternative 1A. While the
11 intake locations would be reduced to three facilities, slightly reducing the potential for effects on
12 archaeological resources, and thus the overall potential for effects on archaeological resources that
13 may not be identified through inventory is similar.

14 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
15 resources by disrupting the spatial associations that convey data useful in research or changing the
16 setting such that the resource no longer contains its significance. These impacts would thus
17 materially impair these resources within the meaning of CEQA and adversely affect the resources
18 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
19 these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these
20 effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of
21 some resources is inevitable given the scale of the proposed construction. These effects would
22 therefore remain adverse.

23 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
24 sites that also may not necessarily be identified prior to construction. While cultural resource
25 inventories will be completed once legal access is secured, no inventory can ensure that all
26 resources are identified prior to construction. Because these sites may qualify for the NRHP or
27 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
28 adverse.

29 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
30 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
31 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
32 disrupt the spatial associations that contain scientifically useful information it would alter the
33 potential basis for eligibility, thus materially altering the resource and resulting in a significant
34 effect. Because these resources would not be identified prior to construction, they cannot be
35 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
36 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
37 worker training, monitoring and discovery protocols. However, because archaeological resources
38 may not be identified prior to disturbance through these measures, the effect cannot be entirely
39 avoided. Therefore, this impact would remain significant and unavoidable.

1 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
 2 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

3 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

4 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

5 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
 6 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
 7 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
 8 Alternative 1A. While the intake locations would be reduced to three facilities, slightly reducing the
 9 potential for effects on buried human remains, the overall potential for effects on buried human
 10 remains is similar.

11 Ground-disturbing construction has the potential to damage and disinter buried human remains,
 12 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
 13 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
 14 remains adverse.

15 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 16 may occur either in isolation or as part of identified and previously unidentified archaeological
 17 resources where construction will occur. This effect would be adverse.

18 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
 19 remains. Construction would likely result in disturbance of these features. Disturbance of human
 20 remains, including remains interred outside of cemeteries is considered a significant impact in the
 21 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
 22 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
 23 significant level because mitigation would not guarantee that these features could be discovered and
 24 treated in advance of construction; the scale of construction makes it technically and economically
 25 infeasible to perform the level of sampling necessary to identify all such resources prior to
 26 construction. Therefore, this impact is considered significant and unavoidable.

27 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 28 **Such Resources Are Discovered during Construction**

29 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

30 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic**
 31 **Architectural/Built-Environment Resources Resulting from Construction Activities**

32 Built-environment resources that may be affected by this alternative include resources identified
 33 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
 34 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 35 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 36 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 37 18B, Table 18B-14, a total of 19 built-environment resources have the potential to be directly or
 38 indirectly affected by construction of this alternative. The specific nature and location of the impact
 39 mechanism for each affected resource is also described in Table 18B-14. The affected resources have
 40 been evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each
 41 resource is provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

1 Discussion of Anticipated Effects on Identified and Accessible Resources

2 Construction of intakes, transmission lines and other features will result in direct and indirect
 3 effects on identified and eligible built-environment resources. The exact effect mechanism for each
 4 resource is described in Appendix 18B, in Table 18B-14. Facility redesign to avoid direct impacts on
 5 historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all
 6 identified resources can be avoided because of the scale of the BDCP and the need to balance
 7 avoidance of other important environmental resources such as wetlands, natural communities, and
 8 special-status species habitat. These effects would materially impair the resources within the
 9 meaning of CEQA and result in adverse effects within the meaning of Section 106 because they
 10 would diminish the characteristics that convey the significance of the resources. Some direct
 11 demolition and indirect effects such as setting changes are likely to occur even with mitigation.
 12 Therefore, these effects would be adverse.

13 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
 14 built environment resources. These alterations may diminish the integrity of these resources. For
 15 these reasons this effect would be adverse.

16 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
 17 in the footprint of this alternative (19 individual resources, as described in Appendix 18B, Table
 18 18B-14). These resources have been evaluated for the CRHR and qualify as historical resources
 19 under CEQA. Construction of conveyance facilities may require demolition of the historic built-
 20 environment resources. Construction may also result in permanent indirect effects such as changes
 21 to the setting. Direct demolition or changes to the setting would be material alterations because they
 22 would either remove the resource or alter the resource character, resulting in an inability of the
 23 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
 24 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
 25 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
 26 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
 27 even with implementation of the following mitigation measures.

28 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built** 29 **Environment Treatment Plan**

30 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

31 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic** 32 **Architectural/Built-Environment Resources Resulting from Construction Activities**

33 The footprint of this alternative is sensitive for unidentified and unevaluated built-environment
 34 resources that may have significance and integrity for the same reasons described under Alternative
 35 1A. Approximately 71 unevaluated built-environment resources have been identified that may be
 36 subject to direct or indirect effects as a result of the construction of this alternative (ICF 2012, see
 37 tables of inaccessible properties and associated maps).

38 **Anticipated Effects**

39 Construction may result in direct demolition of these resources, damage through vibration, or
 40 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
 41 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
 42 guarantee that eligible resources would be avoided and that adverse changes to the setting would

1 not occur. Construction has the potential to directly or indirectly damage built-environment
 2 resources through demolition or introduction of new inconsistent features into the setting. These
 3 changes would impair the ability of the resources to convey their significance because the character
 4 defining elements or setting of the resource would be lost. Therefore, impacts on these resources
 5 may be adverse.

6 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
 7 inaccessible and NRHP and CRHR-eligible built environment resources. These changes may diminish
 8 the integrity of these resources. For these reasons, this effect would be adverse.

9 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
 10 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
 11 efforts have not gathered complete information in these inaccessible areas. Many of these resources
 12 are likely to be associated with important historical themes or persons, or possess high creative
 13 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
 14 these resources remain intact and retain their rural agricultural setting they are also likely to have
 15 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
 16 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
 17 demolition of the historic built-environment resources. Construction may also result in permanent
 18 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
 19 material alterations because they would either remove the resource or alter the resource character,
 20 resulting in an inability of the resource to convey its significance. For these reasons this would be a
 21 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
 22 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
 23 environmental resources make avoidance of all significant effects unlikely. For these reasons this
 24 impact remains significant and unavoidable even with implementation of the following mitigation
 25 measures.

26 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess**
 27 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and**
 28 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

29 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

30 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

31 This impact describes the potential effects of other conservation measures at a program level of
 32 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
 33 to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources,
 34 scope of activities, and geographic area of effects are generally similar. These measures would result
 35 in effects on cultural resources when ground-disturbing work is performed to construct
 36 improvements and enhance or restore natural communities. Direct effects would occur through
 37 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
 38 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment
 39 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
 40 manner that is inconsistent with the feeling and association of the resource. Because the ability of
 41 the resources to convey their significance would be lost this effect would materially alter these
 42 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural
 43 landscapes that are converted to habitat may no longer convey the themes of agriculture and

1 settlement, and thus would be inconsistent with remaining features associated with rural historic
2 landscapes created by reclamation, cultivation, and ranching.

3 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
4 land included in all conservation measures that would be implemented under this alternative, it is
5 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
6 archaeological sites could be avoided. Therefore, this impact would be adverse.

7 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
8 introduction of new infrastructure to the Plan Area. These physical modifications may result in
9 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
10 integrity of these resources. For these reasons these effects would be adverse.

11 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
12 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
13 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
14 built-environment resources such as historic architectural structures and rural historic landscapes.
15 The same construction may damage unique archaeological sites. This construction would likely
16 result in materially adverse changes for the following reasons:

- 17 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
18 contain data useful in research, thus diminishing or destroying the basis for the significance of
19 the resource, and;
- 20 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
21 built-environment resources, resulting in an inability of the resource to convey its significance,
22 and;
- 23 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
24 resulting in an inability of the resource to convey its significance.
- 25 ● Ground-disturbing construction may inadvertently disturb human remains.

26 The alteration of a resource that changes the characteristics that convey its significance is a material
27 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
28 CEQA under the Appendix G checklist. Because this construction would materially alter these
29 categories of resources and disturb human remains it would result in a significant impact. Mitigation
30 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
31 where possible, and developing treatment where avoidance is not possible. In addition construction
32 would be monitored. However, because of the acreage associated with the proposed restoration
33 under conservation measures, as well as the multiple constraints associated with other
34 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
35 resources could be avoided. Therefore, this impact remains significant and unavoidable.

36 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
37 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
38 **Implementation of Conservation Measures 2–22**

39 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

1 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other** 2 **Conservation Measures with Plans and Policies**

3 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
4 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
5 resources of the Delta. A number of plans and policies that coincide with the study area provide
6 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
7 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
8 Alternative 7 is compatible or incompatible with these policies, rather than whether impacts are
9 adverse or not adverse or significant or less than significant. Because Alternative 7 would result in
10 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land
11 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
12 BDCP will be compatible with these policies because significant cultural resources will be avoided
13 where feasible, and mitigation will be implemented to reduce effects where avoidance and
14 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
15 some instances because multiple constraints governing the location of proposed facilities makes
16 preservation of all significant cultural resources unlikely. It should be noted that, as described in
17 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
18 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

19 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
20 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

21 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
22 the various counties with jurisdiction in this region. For policies that emphasize preservation or
23 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
24 agencies will implement cultural resource management practices that will identify significant
25 resources, preserve such resources where feasible, and complete mitigation to reduce significant
26 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
27 incompatible in some instances because multiple constraints governing the location of proposed
28 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
29 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
30 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
31 environment.

32 **18.3.5.15 Alternative 8—Dual Conveyance with Pipeline/Tunnel, Intakes 2, 3,** 33 **and 5, and Increased Delta Outflow (9,000 cfs; Operational Scenario** 34 **F)**

35 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of** 36 **Conveyance Facilities**

37 **Identified Resources**

38 Record searches at the CHRIS and inventory efforts for the BDCP have identified six previously
39 recorded archaeological sites in the footprint of this alternative (Appendix 18B, Table 18B-1).
40 Detailed site descriptions summarizing available information regarding these resources, are
41 provided in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*. Two of these sites have
42 human remains documented as part of the deposit.

1 The resources are distributed evenly across the alignment, but are somewhat clustered where
2 construction of large above-ground features would occur, such as the northern end of the alignment,
3 at the intermediate forebay, and at the southern end of the alignment.

4 **Significance of Identified Archaeological Resources**

5 The resources affected by this alternative have likely have significance and integrity within the
6 meaning of the NRHP and CRHR for the same reasons described above under Alternative 1A.

7 **Anticipated Effects on Identified Resources**

8 Ground-disturbing construction is likely to disturb the deposits and thus materially alter their
9 ability to convey their significance. Much of the data potential in archaeological resources exists in
10 the spatial associations of different artifacts and other cultural material. Where artifacts that have
11 known associations with particular time periods occur adjacent to other material such as faunal
12 bone or plant remains from subsistence activity, the proximity of the materials allows an inference
13 as to the age of the subsistence remains, thereby allowing researchers to infer particular subsistence
14 strategies during different prehistoric periods. Intrusive ground-disturbing construction, vibration,
15 and other physical disturbance may disrupt these associations and thus disrupt the qualities for
16 which the sites may qualify as historical resources or historic properties. In addition, because not all
17 identified resources are legally accessible, these resources may be significant for other reasons than
18 their data potential. Indirect effects such as introduction of changes to the setting associated with
19 construction of new features or creation of new sources of noise (also a change to the setting) may
20 diminish the basis for the significance of these resources. For these reasons, construction has the
21 potential to materially impair these resources under CEQA and to adversely affect the resources as
22 defined by Section 106 of the NHPA. This effect would be adverse.

23 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
24 damage these resources. This damage may impair the integrity of these resources and thus reduce
25 their ability to convey their significance. For these reasons this effect would be adverse.

26 **CEQA Conclusion:** Construction of conveyance facilities would affect six identified archaeological
27 resources that occur in the footprint of this alternative. DWR identified these resources and finds
28 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
29 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
30 potential to qualify as historical resources. Therefore, these sites are considered historic resources
31 for the purposes of CEQA. This impact would be significant because construction could materially
32 alter or destroy the potential of these resources to yield information useful in archaeological
33 research, the basis for the significance of these resources, through excavation and disruption of the
34 spatial associations that contain meaningful information. Identified but currently inaccessible
35 resources may also be significant under other register criteria; indirect effects such as introduction
36 of new inconsistent changes to the setting may also diminish the significance of these resources.
37 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the
38 scientifically important material would be retrieved because feasible archaeological excavation only
39 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
40 important information. Construction could damage these remaining portions of the deposit.
41 Therefore, this impact is significant and unavoidable.

1 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
2 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
3 **Archaeological Sites**

4 Please refer to Mitigation Measure CUL-1 under Alternative 1A.

5 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory**
6 **Efforts**

7 This impact is substantially similar to Impact CUL-2 described under Alternative 1A. While the
8 intake locations would be reduced to three facilities, slightly reducing the potential for effects on
9 archaeological resources that have yet to be identified, the overall potential for effects on these
10 kinds of resources is similar.

11 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
12 resources by disrupting the spatial associations that convey data useful in research or changing the
13 setting such that the resource no longer contains its significance. The locations of various features
14 such as intakes, forebays, and tunnels shaft locations are depicted in Figure M3-1 in the mapbook
15 volume. These impacts would thus materially impair these resources within the meaning of CEQA
16 and adversely affect the resources within the meaning of Section 106 of the NHPA because this
17 disturbance would impair the ability of these resources to yield data useful in research. While
18 Mitigation Measure CUL-2 would reduce these effects, it cannot guarantee all effects would be
19 avoided because relocation of proposed facilities to avoid all resources is unlikely. These effects
20 would remain adverse.

21 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
22 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
23 their integrity. For these reasons this effect would be adverse.

24 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
25 resources that cannot be identified at this time because much of the footprint is not legally
26 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
27 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
28 as historical resources or unique archaeological sites under CEQA or historic properties under the
29 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
30 these resources by disrupting the spatial associations that could yield important data, resulting in a
31 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
32 guarantee that all eligible or significant resources would be preserved in place, or that all important
33 data would be retrieved before construction destroys these resources. The scale of the BDCP,
34 investment into existing designs, and the presence of other important environmental resources such
35 as habitat, natural communities, and wetlands that should be avoided are constraints on the
36 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

37 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of**
38 **Archaeological Resources**

39 Please refer to Mitigation Measure CUL-2 as described under Alternative 1A.

1 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory**
 2 **Efforts**

3 This impact is substantially similar to Impact CUL-3 described under Alternative 1A. While the
 4 intake locations would be reduced to three facilities, slightly reducing the potential for effects on
 5 archaeological resources, and thus the overall potential for effects on archaeological resources is
 6 similar.

7 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 8 resources by disrupting the spatial associations that convey data useful in research or changing the
 9 setting such that the resource no longer contains its significance. These impacts would thus
 10 materially impair these resources within the meaning of CEQA and adversely affect the resources
 11 within the meaning of Section 106 of the NHPA because this disturbance would impair the ability of
 12 these resources to yield data useful in research. Mitigation Measure CUL-3 would reduce these
 13 effects, but cannot guarantee that all effects would be avoided because inadvertent disturbance of
 14 some resources is inevitable given the scale of the proposed construction. These effects would
 15 therefore remain adverse.

16 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 17 sites that also may not necessarily be identified prior to construction. While cultural resource
 18 inventories will be completed once legal access is secured, no inventory can ensure that all
 19 resources are identified prior to construction. Because these sites may qualify for the NRHP or
 20 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
 21 adverse.

22 **CEQA Conclusion:** This impact would be significant. Construction has the potential to disturb
 23 previously unidentified archaeological sites qualifying as historical resources, historic properties, or
 24 unique archaeological resources. Because direct excavation, compaction, or other disturbance may
 25 disrupt the spatial associations that contain scientifically useful information it would alter the
 26 potential basis for eligibility, thus materially altering the resource and resulting in a significant
 27 effect. Because these resources would not be identified prior to construction, they cannot be
 28 recorded and effects cannot be managed through construction treatment. Mitigation Measures CUL-
 29 3 would reduce but not entirely avoid the potential for this impact, by implementing construction
 30 worker training, monitoring and discovery protocols. However, because archaeological resources
 31 may not be identified prior to disturbance through these measures, the effect cannot be entirely
 32 avoided. Therefore, this impact would remain significant and unavoidable.

33 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
 34 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

35 Please refer to Mitigation Measure CUL-3 as described under Alternative 1A.

36 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

37 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
 38 rather than as part of prehistoric or historic archaeological sites. This sensitivity and the impact
 39 mechanisms are substantially similar to the sensitivity and impact mechanisms described under
 40 Alternative 1A. While the intake locations would be reduced to three facilities, slightly reducing the
 41 potential for effects on buried human remains, the overall potential for effects on buried human
 42 remains is similar.

1 Ground-disturbing construction has the potential to damage and disinter buried human remains,
 2 resulting in an adverse effect. While mitigation is available under Mitigation Measure CUL-4 to
 3 reduce this effect, it cannot guarantee that this effect would be avoided entirely, therefore this effect
 4 remains adverse.

5 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 6 may occur either in isolation or as part of identified and previously unidentified archaeological
 7 resources where construction will occur. This effect would be adverse.

8 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
 9 remains. Construction would likely result in disturbance of these features. Disturbance of human
 10 remains, including remains interred outside of cemeteries is considered a significant impact in the
 11 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
 12 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
 13 significant level because mitigation would not guarantee that these features could be discovered and
 14 treated in advance of construction; the scale of construction makes it technically and economically
 15 infeasible to perform the level of sampling necessary to identify all such resources prior to
 16 construction. Therefore, this impact is considered significant and unavoidable.

17 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 18 **Such Resources Are Discovered during Construction**

19 Please refer to Mitigation Measure CUL-4 as described under Alternative 1A.

20 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic**
 21 **Architectural/Built-Environment Resources Resulting from Construction Activities**

22 Built-environment resources that may be affected by this alternative include resources identified
 23 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
 24 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 25 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 26 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 27 18B, Table 18B-15, a total of 19 built-environment resources have the potential to be directly or
 28 indirectly affected by construction of this alternative. The specific nature and location of the impact
 29 mechanism for each affected resource is also described in Table 18B-15. The affected resources have
 30 been evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each
 31 resource is provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

32 **Discussion of Anticipated Effects on Identified and Accessible Resources**

33 Construction of intakes, transmission lines, and other features will result in direct and indirect
 34 effects on identified and eligible built-environment resources. The exact effect mechanism for each
 35 resource is described in Appendix 18B, in Table 18B-15. Facility redesign to avoid direct impacts on
 36 historic architectural resources is preferred as mitigation if possible. However, it is unlikely that all
 37 identified resources can be avoided because of the scale of the BDCP and the need to balance
 38 avoidance of other important environmental resources such as wetlands, natural communities, and
 39 special-status species habitat. These effects would materially impair the resources within the
 40 meaning of CEQA and result in adverse effects within the meaning of Section 106 because they
 41 would diminish the characteristics that convey the significance of the resources. Some direct

1 demolition and indirect effects such as setting changes are likely to occur even with mitigation.
2 Therefore, these effects would be adverse.

3 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
4 built environment resources. These alterations may diminish the integrity of these resources. For
5 these reasons this effect would be adverse.

6 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
7 in the footprint of this alternative (19 individual resources, as described in Appendix 18B, Table
8 18B-15). These resources have been evaluated for the CRHR and qualify as historical resources
9 under CEQA. Construction of conveyance facilities may require demolition of the historic built-
10 environment resources. Construction may also result in permanent indirect effects such as changes
11 to the setting. Direct demolition or changes to the setting would be material alterations because they
12 would either remove the resource or alter the resource character, resulting in an inability of the
13 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
14 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
15 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
16 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
17 even with implementation of the following mitigation measures.

18 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built**
19 **Environment Treatment Plan**

20 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

21 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic**
22 **Architectural/Built-Environment Resources Resulting from Construction Activities**

23 The footprint of this alternative is sensitive for unidentified and unevaluated built-environment
24 resources that may have significance and integrity for the same reasons described under Alternative
25 1A. Approximately 71 unevaluated built-environment resources have been identified that may be
26 subject to direct or indirect effects as a result of the construction of this alternative (ICF 2012, see
27 tables of inaccessible properties and associated maps).

28 **Anticipated Effects**

29 Construction may result in direct demolition of these resources, damage through vibration, or
30 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
31 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot
32 guarantee that eligible resources would be avoided and that adverse changes to the setting would
33 not occur. Construction has the potential to directly or indirectly damage built-environment
34 resources through demolition or introduction of new inconsistent features into the setting. These
35 changes would impair the ability of the resources to convey their significance because the character
36 defining elements or setting of the resource would be lost. Therefore, impacts on these resources
37 may be adverse.

38 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
39 inaccessible and NRHP and CRHR-eligible built environment resources. These changes may diminish
40 the integrity of these resources. For these reasons, this effect would be adverse.

1 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
 2 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
 3 efforts have not gathered complete information in these inaccessible areas. Many of these resources
 4 are likely to be associated with important historical themes or persons, or possess high creative
 5 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
 6 these resources remain intact and retain their rural agricultural setting they are also likely to have
 7 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
 8 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
 9 demolition of the historic built-environment resources. Construction may also result in permanent
 10 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
 11 material alterations because they would either remove the resource or alter the resource character,
 12 resulting in an inability of the resource to convey its significance. For these reasons this would be a
 13 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
 14 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
 15 environmental resources make avoidance of all significant effects unlikely. For these reasons this
 16 impact remains significant and unavoidable even with implementation of the following mitigation
 17 measures.

18 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess**
 19 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and**
 20 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

21 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

22 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

23 This impact describes the potential effects of other conservation measures at a program level of
 24 detail, with the exception of *CM1 Water Facilities and Operation*. This impact is substantially similar
 25 to Impact CUL-7 as discussed under Alternative 1A because the nature of the affected resources,
 26 scope of activities, and geographic area of effects are generally similar. These measures would result
 27 in effects on cultural resources when ground-disturbing work is performed to construct
 28 improvements and enhance or restore natural communities. Direct effects would occur through
 29 demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible prehistoric and historic
 30 archaeological sites, unique archaeological sites, TCPs, human remains, and built-environment
 31 resources. Indirect effects may occur where changes to the setting alter the existing setting in a
 32 manner that is inconsistent with the feeling and association of the resource. Because the ability of
 33 the resources to convey their significance would be lost this effect would materially alter these
 34 resources under CEQA and would be adverse under NEPA. For example, reclaimed agricultural
 35 landscapes that are converted to habitat may no longer convey the themes of agriculture and
 36 settlement, and thus would be inconsistent with remaining features associated with rural historic
 37 landscapes created by reclamation, cultivation, and ranching.

38 Mitigation Measure CUL-7 below addresses this effect. However, because of the large acreages of
 39 land included in all conservation measures that would be implemented under this alternative, it is
 40 unlikely that all effects on NRHP-, CRHR-, and /or local registry-eligible resources and unique
 41 archaeological sites could be avoided. Therefore, this impact would be adverse.

42 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
 43 introduction of new infrastructure to the Plan Area. These physical modifications may result in

1 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
2 integrity of these resources. For these reasons these effects would be adverse.

3 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
4 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
5 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
6 built-environment resources such as historic architectural structures and rural historic landscapes.
7 The same construction may damage unique archaeological sites. This construction would likely
8 result in materially adverse changes for the following reasons.

- 9 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
10 contain data useful in research, thus diminishing or destroying the basis for the significance of
11 the resource.
- 12 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
13 built-environment resources, resulting in an inability of the resource to convey its significance.
- 14 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
15 resulting in an inability of the resource to convey its significance.
- 16 ● Ground-disturbing construction may inadvertently disturb human remains.

17 The alteration of a resource that changes the characteristics that convey its significance is a material
18 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
19 CEQA under the Appendix G checklist. Because this construction would materially alter these
20 categories of resources and disturb human remains it would result in a significant impact. Mitigation
21 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
22 where possible, and developing treatment where avoidance is not possible. In addition construction
23 would be monitored. However, because of the acreage associated with the proposed restoration
24 under conservation measures, as well as the multiple constraints associated with other
25 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
26 resources could be avoided. Therefore, this impact remains significant and unavoidable.

27 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
28 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
29 **Implementation of Conservation Measures 2–22**

30 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A

31 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other**
32 **Conservation Measures with Plans and Policies**

33 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
34 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
35 resources of the Delta. A number of plans and policies that coincide with the study area provide
36 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
37 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
38 Alternative 8 is compatible or incompatible with these policies, rather than whether impacts are
39 adverse or not adverse or significant or less than significant. Because Alternative 8 would result in
40 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land
41 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
42 BDCP will be compatible with these policies because significant cultural resources will be avoided

1 where feasible, and mitigation will be implemented to reduce effects where avoidance and
 2 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
 3 some instances because multiple constraints governing the location of proposed facilities makes
 4 preservation of all significant cultural resources unlikely. It should be noted that, as described in
 5 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
 6 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

7 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
 8 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

9 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
 10 the various counties with jurisdiction in this region. For policies that emphasize preservation or
 11 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
 12 agencies will implement cultural resource management practices that will identify significant
 13 resources, preserve such resources where feasible, and complete mitigation to reduce significant
 14 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
 15 incompatible in some instances because multiple constraints governing the location of proposed
 16 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
 17 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
 18 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
 19 environment.

20 **18.3.5.16 Alternative 9—Through Delta/Separate Corridors (15,000 cfs;** 21 **Operational Scenario G)**

22 **Impact CUL-1: Effects on Identified Archaeological Sites Resulting from Construction of** 23 **Conveyance Facilities**

24 **Identified Resources**

25 Record searches at the CHRIS and inventory efforts for the BDCP have identified four previously
 26 recorded archaeological sites in the footprint of this alternative as indicated in Appendix 18B, Table
 27 18B-1. Individual site descriptions are provided in Appendix 18B, Section B.1.2 *Archaeological Site*
 28 *Descriptions*.

29 **Significance of Identified Archaeological Resources**

30 The site record for CA-SAC-47 describes a site measuring 30 meters by 90 meters across. The sparse
 31 record only indicates that Dr. Robert Heizer removed artifacts from the site to a museum. The size of
 32 the deposit is consistent with expectations for a midden site. The site record does indicate that the
 33 erosion and damage to the site is "slight." The site record for CA-SAC-75 describes a midden deposit
 34 distributed in a linear form extending north-south for approximately 400 meters. The deposit at CA-
 35 SAC-249 contains human remains, obsidian and chert debitage, chert projectile points, fire-cracked
 36 rock, mortar and pestle fragments, and glass beads. This prehistoric deposit was recorded in 1962,
 37 with no subsequent update to the site record. The site record indicates that the site contains shell,
 38 bone, burnt clay objects in a deposit spanning approximately 12 meters by 3 meters. The site record
 39 indicates some loss of integrity through surface grading for agriculture. The historic archaeological
 40 deposit recorded at CA-SJo-232-H consists of historic cultural debris containing the remains of
 41 agricultural equipment, old stoves, glass, ceramic and metal. The site measures approximately 350

1 feet across (dimensions for historic resources are typically given in standard increments, the site
2 spans 107 meters). The deposit was associated with several standing structures at the time of the
3 last site record update (1991), which may have subsequently collapsed; the structures appear to be
4 leaning in the available photographs. Because these materials and deposits may yield information
5 useful in prehistoric and historic research they likely have significance under the fourth criterion for
6 the CRHR and the NRHP. If these sites retain sufficient integrity to convey this significance they may
7 qualify as historical resources or historic properties.

8 **Anticipated Effects on Identified Resources**

9 The exact location of these resources cannot be disclosed because such disclosure might lead to
10 damage. However CA-SAC-47 and CA-SAC-75 occur near a potential work areas. If the site
11 boundaries actually extend into the work areas, ground-disturbing construction, staging, or other
12 activity may damage this resource. The mapped location of CA-SAC-249 coincides with the footprint
13 of proposed channel enlargement. Ground-disturbing construction may thus damage this resource.
14 The mapped boundaries of CA-SJo-232-H coincide with the location of an operable barrier.
15 Construction of this feature may disturb and damage the resource.

16 Much of the data potential in archaeological resources exists in the spatial associations of different
17 artifacts and other cultural material. Where artifacts that have known associations with particular
18 time periods occur adjacent to other material such as faunal bone or plant remains from subsistence
19 activity, the proximity of the materials allows an inference as to the age of the subsistence remains,
20 thereby allowing researchers to infer particular subsistence strategies during different prehistoric
21 periods. Intrusive ground-disturbing construction, vibration, and other physical disturbance may
22 disrupt these associations and thus disrupt the qualities for which the sites may qualify as historical
23 resources or historic properties. In addition, because not all identified resources are legally
24 accessible, these resources may be significant for other reasons than their data potential. Indirect
25 effects such as introduction of changes to the setting associated with construction of new features or
26 creation of new sources of noise (also a change to the setting) may diminish the basis for the
27 significance of these resources. For these reasons, construction has the potential to materially
28 impair these resources under CEQA and to adversely affect the resources as defined by Section 106
29 of the NHPA. This effect would be adverse.

30 **NEPA Effects:** Construction may disturb NRHP and CRHR-eligible archaeological resources and
31 damage these resources. This damage may impair the integrity of these resources and thus reduce
32 their ability to convey their significance. For these reasons this effect would be adverse.

33 **CEQA Conclusion:** Construction of conveyance facilities would affect four identified archaeological
34 resources that occur in the footprint of this alternative. DWR identified these resources and finds
35 that they are likely to qualify as historical resources under CEQA (see the individual site descriptions
36 in Appendix 18B, Section B.1.2 *Archaeological Site Descriptions*); these resources thus have the
37 potential to qualify as historical resources. Therefore, these sites are considered historic resources
38 for the purposes of CEQA. This impact would be significant because construction could materially
39 alter or destroy the potential of these resources to yield information useful in archaeological
40 research, the basis for the significance of these resources, through excavation and disruption of the
41 spatial associations that contain meaningful information. Identified but currently inaccessible
42 resources may also be significant under other register criteria; indirect effects such as introduction
43 of new inconsistent changes to the setting may also diminish the significance of these resources.
44 Mitigation Measure CUL-1 would reduce this impact, but would not guarantee that all of the

1 scientifically important material would be retrieved because feasible archaeological excavation only
 2 typically retrieves a sample of the deposit, and portions of the site may remain after treatment with
 3 important information. Construction could damage these remaining portions of the deposit.
 4 Therefore, this impact is significant and unavoidable.

5 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
 6 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
 7 **Archaeological Sites**

8 Please refer to Mitigation Measure CUL-1 for Alternative 1A, above.

9 **Impact CUL-2: Effects on Archaeological Sites to Be Identified through Future Inventory**
 10 **Efforts**

11 An inventory for the majority of the footprint for this alternative has not been conducted because
 12 the footprint is not currently legally accessible (see Appendix 4A, *Summary of Survey Data Collection*
 13 *by Department of Water Resources to Obtain Information Regarding Baseline Conditions in Areas That*
 14 *Could Be Affected by BDCP*). Furthermore, complete evaluation of all potentially affected resources
 15 associated with this alternative may require destructive test excavation in advance of any final
 16 decision regarding the selection of the alternative. Because several prehistoric archaeological sites
 17 qualifying as historical resources have been identified in the footprint of this alternative, the
 18 remaining portion of the footprint for this conveyance feature is sensitive for previously
 19 unidentified archaeological resources. Record searches at the relevant information centers of the
 20 CHRIS reviewed the mapped location of previous cultural resource inventories in the footprint of
 21 this alternative and the vicinity. This map review revealed that a cultural resources inventory has
 22 never been conducted in the majority of the footprint for Alternative 9. The presence of three
 23 archaeological sites that qualify as historical resources and historic properties in the portion of the
 24 footprint that has been previously inspected provides a sample of the likely density and occurrence
 25 of resources in the remaining footprint. For this reason, additional prehistoric archaeological
 26 resources are likely to be found in the portion of the footprint where surveys have not been
 27 conducted, once access is available and such studies can be completed.

28 In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era
 29 archaeological resources. It is likely that previously unidentified historic archaeological sites occur
 30 in the footprint of this alternative because of the intensity of human activity in the Plan Area during
 31 the historic era, as described in Section 18.1.6, *Historic-Era Setting*.

32 Prehistoric sites in the Plan Area tend to be large and rich in material remains, including human
 33 burials and associated ornaments and beads. Habitation debris also often contains both floral and
 34 faunal material that can be used for both radiocarbon dating and analysis regarding subsistence
 35 strategies. In addition, the large scale of typical prehistoric archaeological resources suggests
 36 portions of these deposits will remain with sufficient integrity to convey research information.
 37 Therefore, these sites are likely to qualify as historical resources or unique archaeological resources
 38 under CEQA and historic properties under Section 106 of the NHPA.

39 Historic sites are likely to be associated with the historic-era themes of settlement, reclamation,
 40 agriculture, and flood management in the Delta region. Because the reclamation and agricultural
 41 development of the Delta region provided part of the economic base for the development of
 42 surrounding urban centers, these historic themes are significant at both a state and national level. In
 43 addition, the intensity of historic activity in the Delta region suggests that many of these resources

1 are likely to retain sufficient integrity to convey this significance. Therefore, these sites are likely to
 2 qualify as historical resources or unique archaeological resources under CEQA and historic
 3 properties under Section 106 of the NHPA.

4 Absent mitigation, ground-disturbing construction is likely to physically damage many of these
 5 resources by disrupting the spatial associations that convey data useful in research or changing the
 6 setting such that the resource no longer contains its significance. The locations of ground-disturbing
 7 features such as borrow and spoil areas, control structures, and pumping plants are depicted in
 8 Figure M3-5 in the mapbook volume. These impacts would thus materially impair these resources
 9 within the meaning of CEQA and adversely affect the resources within the meaning of Section 106 of
 10 the NHPA. These effects would be adverse.

11 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
 12 sites. Because these sites may qualify for the NRHP or CRHR, damage to these sites may diminish
 13 their integrity. For these reasons this effect would be adverse.

14 **CEQA Conclusion:** The footprint for this alternative is sensitive for both prehistoric and historic-era
 15 resources that cannot be identified at this time because much of the footprint is not legally
 16 accessible. Because many of these resources are likely to have data useful in prehistoric and historic
 17 archaeological research, as well as the integrity to convey this significance, they are likely to qualify
 18 as historical resources or unique archaeological sites under CEQA or historic properties under the
 19 Section 106 of the NHPA. Ground-disturbing construction may materially alter the significance of
 20 these resources by disrupting the spatial associations that could yield important data, resulting in a
 21 significant effect. While mitigation is available (Mitigation Measure CUL-2), this mitigation cannot
 22 guarantee that all eligible or significant resources would be preserved in place, or that all important
 23 data would be retrieved before construction destroys these resources. The scale of the BDCP,
 24 investment into existing designs, and the presence of other important environmental resources such
 25 as habitat, natural communities, and wetlands that should be avoided are constraints on the
 26 flexibility and feasibility of avoidance. For these reasons this impact is significant and unavoidable.

27 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of**
 28 **Archaeological Resources**

29 Please refer to Mitigation Measure CUL-2 for Alternative 1A, above.

30 **Impact CUL-3: Effects on Archaeological Sites That May Not Be Identified through Inventory**
 31 **Efforts**

32 Appendix 18A, *Archaeological Resources Sensitivity Assessment*, presents an overview of the
 33 sensitivity of the Plan Area for previously unidentified archaeological resources and demonstrates
 34 that additional prehistoric and historic-era sites that have not yet been identified are almost certain
 35 to occur in the portion of the Plan Area where this alternative would be constructed. While surveys
 36 will be completed for the footprint, once access is available, such surveys cannot guarantee that all
 37 sites will be identified prior to construction. The rapid rate of at which alluvium and sediment
 38 accumulates in the Delta region, and the geologically unstable nature of the floodplain and riverbank
 39 environments in which these resources may occur makes it likely that numerous sites occur buried
 40 below surface soils. Cultural resource inventory efforts cannot always identify such resources, even
 41 with intermittent surface excavation designed to reveal sites with little or no surface manifestation
 42 because exhaustive sampling to identify every resource is economically and technically infeasible.

1 These sites may also occur buried at the depth at which tunnel boring operations would be
2 performed.

3 Many of these unidentified prehistoric resources are likely to qualify as historical resources, historic
4 properties, or unique archaeological resources because prehistoric sites in the Delta region tend to
5 be large and contain a rich material culture. In particular, burial features tend to be associated with
6 numerous shell ornaments, charmstones, and associated grave goods. Habitation components often
7 contain abundant faunal and floral remains that elucidate prehistoric adaptations such as
8 subsistence methods.

9 In addition to prehistoric archaeological resources, the BDCP area is sensitive for historic-era
10 archaeological resources. Archaeological debris found in historic era archaeological sites activity is
11 likely to be associated with significant themes such as agriculture, reclamation, and settlement of the
12 Delta region. The size of the BDCP area and the intensity of historic activity suggest that some of
13 these resources may qualify as historical resources, historic properties, or unique archaeological
14 resources.

15 Ground-disturbing work may disturb and damage these resources before they can be identified and
16 avoided during monitoring efforts required under Mitigation Measure CUL-3. This damage and
17 disturbance may materially impair these resources within the meaning of CEQA or adversely affect
18 the resources within the meaning of Section 106 because this disturbance would impair the ability
19 of these resources to yield data useful in research. While Mitigation Measure CUL-3 would reduce
20 the potential for this impact, it would not guarantee the impact would be avoided entirely.
21 Therefore, this impact is adverse.

22 **NEPA Effects:** This alternative has the potential to damage previously unidentified archaeological
23 sites that also may not necessarily be identified prior to construction. While cultural resource
24 inventories will be completed once legal access is secured, no inventory can ensure that all
25 resources are identified prior to construction. Because these sites may qualify for the NRHP or
26 CRHR, damage to these sites may diminish their integrity. For these reasons this effect would be
27 adverse.

28 **CEQA Conclusion: CEQA Conclusion:** This impact would be significant. Construction has the
29 potential to disturb previously unidentified archaeological sites qualifying as historical resources,
30 historic properties, or unique archaeological resources. Because direct excavation, compaction, or
31 other disturbance may disrupt the spatial associations that contain scientifically useful information
32 it would alter the potential basis for eligibility, thus materially altering the resource and resulting in
33 a significant effect. Because these resources would not be identified prior to construction, they
34 cannot be recorded and effects cannot be managed through construction treatment. Mitigation
35 Measures CUL-3 would reduce but not entirely avoid the potential for this impact, by implementing
36 construction worker training, monitoring and discovery protocols. However, because archaeological
37 resources may not be identified prior to disturbance through these measures, the effect cannot be
38 entirely avoided. Therefore, this impact would remain significant and unavoidable.

39 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
40 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

41 Please refer to Mitigation Measure CUL-3, above, for Alternative 1A.

1 **Impact CUL-4: Effects on Buried Human Remains Damaged during Construction**

2 The footprint of this alternative is sensitive for buried human remains that may occur in isolation,
 3 rather than as part of prehistoric or historic archaeological sites. Historic and prehistoric human
 4 remains have been discovered as isolated interments rather than as part of larger sites. Because
 5 these isolated resources are not associated with larger deposits, their distribution and depth cannot
 6 be estimated. Construction of this alternative would require ground-disturbing work that may
 7 damage previously unidentified human remains, resulting in direct effects on these resources. While
 8 inventory and monitoring efforts are prescribed above under Mitigation Measures CUL-2 and CUL-3,
 9 the large acreages subject to disturbance under this alternative make exhaustive sampling to
 10 identify all buried and isolated human remains technically and economically infeasible. For these
 11 reasons the potential remains that such resources may be damaged or exposed before they can be
 12 discovered through inventory or monitoring. This effect would be adverse.

13 **NEPA Effects:** Buried human remains may be damaged by this alternative because such remains
 14 may occur either in isolation or as part of identified and previously unidentified archaeological
 15 resources where construction will occur. This effect would be adverse.

16 **CEQA Conclusion:** This impact would be significant. The project area is sensitive for buried human
 17 remains. Construction would likely result in disturbance of these features. Disturbance of human
 18 remains, including remains interred outside of cemeteries is considered a significant impact in the
 19 CEQA Appendix G checklist; therefore disturbance of these remains would result in a significant
 20 effect. Mitigation measures would reduce the severity of this impact, but not to a less-than-
 21 significant level because mitigation would not guarantee that these features could be discovered and
 22 treated in advance of construction; the scale of construction makes it technically and economically
 23 infeasible to perform the level of sampling necessary to identify all such resources prior to
 24 construction. Therefore, this impact is considered significant and unavoidable.

25 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if** 26 **Such Resources Are Discovered during Construction**

27 Please refer to Mitigation Measure CUL-4, above, for Alternative 1A.

28 **Impact CUL-5: Direct and Indirect Effects on Eligible and Potentially Eligible Historic** 29 **Architectural/Built-Environment Resources Resulting from Construction Activities**

30 Built-environment resources that may be affected by this alternative include resources identified
 31 and evaluated in inventory efforts conducted for other projects and resources identified in surveys
 32 for the BDCP. Some of resources are considered historic properties for the purposes of this analysis
 33 because they meet the criteria in the NRHP regulations (36 CFR 60.4), as described below. For the
 34 similar reasons some are considered historical resources under CEQA. As identified in Appendix
 35 18B, Table 18B-16, a total of 13 built-environment resources have the potential to be directly or
 36 indirectly affected by construction of this alternative. The specific nature and location of the impact
 37 mechanism for each affected resource is also described in Table 18B-16. The affected resources have
 38 been evaluated for the NRHP and CRHR. The basis for the eligibility recommendations for each
 39 resource is provided in Appendix 18B, in Section B.1.2, *Built Environment Resource Descriptions*.

1 **Discussion of Anticipated Effects on Identified and Accessible Resources**

2 Construction of transmission lines, canals leading to operable barriers, and intakes, and other
 3 features have the potential to result in direct and indirect effects on built-environment resources.
 4 The exact effect mechanism for each resource is described in Appendix 18B, in Table 18B-16.
 5 Facility redesign to avoid direct impacts on historic architectural resources is preferred as
 6 mitigation if possible. However, it is unlikely that all identified resources can be avoided because of
 7 the scale of the BDCP and the need to balance avoidance of other important environmental
 8 resources such as wetlands, natural communities, and special-status species habitat. These effects
 9 would materially impair the resources within the meaning of CEQA and result in adverse effects
 10 within the meaning of Section 106 because they would diminish the characteristics that convey the
 11 significance of the resources. Some direct demolition and indirect effects such as setting changes are
 12 likely to occur even with mitigation. Therefore, these effects would be adverse.

13 **NEPA Effects:** This alternative would result in direct and indirect effects on NRHP and CRHR eligible
 14 built environment resources. These alterations may diminish the integrity of these resources. For
 15 these reasons this effect would be adverse.

16 **CEQA Conclusion:** Several identified historic-era built-environment resources have been identified
 17 in the footprint of this alternative (13 individual resources, as described in Appendix 18B, Table
 18 18B-16). These resources have been evaluated for the CRHR and qualify as historical resources
 19 under CEQA. Construction of conveyance facilities may require demolition of the historic built-
 20 environment resources. Construction may also result in permanent indirect effects such as changes
 21 to the setting. Direct demolition or changes to the setting would be material alterations because they
 22 would either remove the resource or alter the resource character, resulting in an inability of the
 23 resource to convey its significance. For these reasons this would be a significant effect. Mitigation
 24 described below may reduce these effects, but cannot guarantee they would be entirely avoided. The
 25 scale of the BDCP and the constraints imposed by other environmental resources make avoidance of
 26 all significant effects unlikely. For these reasons this impact remains significant and unavoidable
 27 even with implementation of the following mitigation measures.

28 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built** 29 **Environment Treatment Plan**

30 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A

31 **Impact CUL-6: Direct and Indirect Effects on Unidentified and Unevaluated Historic** 32 **Architectural/Built-Environment Resources Resulting from Construction Activities**

33 The footprint of this alternative is sensitive for unidentified and unevaluated built-environment
 34 resources that may have significance and integrity for the same reasons described under Alternative
 35 1A. Approximately 29 unevaluated built-environment resources have been identified that may be
 36 subject to direct or indirect effects as a result of the construction of this alternative (ICF 2012, see
 37 tables of inaccessible properties and associated maps).

38 **Anticipated Effects**

39 Construction may result in direct demolition of these resources, damage through vibration, or
 40 indirect effects such as changes to the setting. While mitigation is available to reduce these effects,
 41 this mitigation cannot guarantee that all effects would be avoided because mitigation cannot

1 guarantee that eligible resources would be avoided and that adverse changes to the setting would
 2 not occur. Construction has the potential to directly or indirectly damage built-environment
 3 resources through demolition or introduction of new inconsistent features into the setting. These
 4 changes would impair the ability of the resources to convey their significance because the character
 5 defining elements or setting of the resource would be lost. Therefore, impacts on these resources
 6 may be adverse.

7 **NEPA Effects:** This alternative may result in direct modification or indirect changes to the setting for
 8 inaccessible and NRHP and CRHR-eligible built environment resources. These changes may diminish
 9 the integrity of these resources. For these reasons, this effect would be adverse.

10 **CEQA Conclusion:** The study area is sensitive for built-environment resources that have not yet
 11 been recorded and evaluated because the majority of the area is legally inaccessible. Inventory
 12 efforts have not gathered complete information in these inaccessible areas. Many of these resources
 13 are likely to be associated with important historical themes or persons, or possess high creative
 14 values; therefore, they are likely to have significance under CEQA and the NHPA. Because many of
 15 these resources remain intact and retain their rural agricultural setting they are also likely to have
 16 integrity under CEQA and the NHPA. Therefore, many are likely to qualify as historic properties or
 17 historical resources under the NHPA and CEQA. Construction of conveyance facilities may require
 18 demolition of the historic built-environment resources. Construction may also result in permanent
 19 indirect effects such as changes to the setting. Direct demolition or changes to the setting would be
 20 material alterations because they would either remove the resource or alter the resource character,
 21 resulting in an inability of the resource to convey its significance. For these reasons this would be a
 22 significant effect. Mitigation described below may reduce these effects, but cannot guarantee they
 23 would be entirely avoided. The scale of the BDCP and the constraints imposed by other
 24 environmental resources make avoidance of all significant effects unlikely. For these reasons this
 25 impact remains significant and unavoidable even with implementation of the following mitigation
 26 measures.

27 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess**
 28 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and**
 29 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

30 Please refer to Mitigation Measure CUL-6 under Alternative 1A.

31 **Impact CUL-7: Effects of Other Conservation Measures on Cultural Resources**

32 This impact describes the potential effects of other conservation measures at a program level of
 33 detail, with the exception of *CM1 Water Facilities and Operation*. The following conservation
 34 measures would not result in impacts on cultural resources because they consist of changes to
 35 existing activities, or planning and regulatory actions that do not have the potential to result in
 36 ground-disturbing work with effects on cultural resources.

- 37 ● *CM11: Natural Communities Enhancement and Management*
- 38 ● *CM12: Methylmercury Management*
- 39 ● *CM13: Invasive Aquatic Vegetation Control*
- 40 ● *CM14: Stockton Deep Water Ship Channel Dissolved Oxygen Levels*
- 41 ● *CM15: Predator Control*

- 1 ● *CM16: Nonphysical Fish Barriers*
- 2 ● *CM17: Illegal Harvest Reduction*
- 3 ● *CM19: Urban Stormwater Treatment*
- 4 ● *CM20: Recreational Users Invasive Species Program*
- 5 ● *CM21: Nonproject Diversions*
- 6 ● *CM22: Avoidance and Minimization Measures*

7 Implementation of the remaining conservation measures could result in effects on prehistoric and
 8 historic archaeological resources, as well as TCPs and the built environment because the scope of
 9 conservation actions includes large areas of land, and the areas identified for potential restoration
 10 or other conservation actions are sensitive for cultural resources, including prehistoric and historic
 11 archaeological sites as well as human remains, architectural resources, and rural historic
 12 landscapes. Specific conservation actions that would result in foreseeable ground-disturbing work
 13 that could alter or impair the significance of NRHP-, CRHR-, or local registry-eligible cultural
 14 resources are listed below.

- 15 ● *CM2: Yolo Bypass Fisheries Enhancement*
- 16 ● *CM3: Natural Communities Protection and Restoration*
- 17 ● *CM4: Tidal Natural Communities Restoration*
- 18 ● *CM5: Seasonally Inundated Floodplain Restoration*
- 19 ● *CM6: Channel Margin Enhancement*
- 20 ● *CM7: Riparian Natural Community Restoration*
- 21 ● *CM8: Grassland Natural Community Restoration*
- 22 ● *CM9: Vernal Pool Complex Restoration*
- 23 ● *CM10: Nontidal Marsh Restoration*
- 24 ● *CM18: Conservation Hatcheries*

25 These measures would result in effects on cultural resources when ground-disturbing work is
 26 performed to construct improvements and enhance or restore natural communities. Direct effects
 27 would occur through demolition or destruction of NRHP-, CRHR-, and/or local registry-eligible
 28 prehistoric and historic archaeological sites, unique archaeological sites, TCPs, human remains, and
 29 built-environment resources. Indirect effects may occur where changes to the setting alter the
 30 existing setting in a manner that is inconsistent with the feeling and association of the resource. For
 31 example, reclaimed agricultural landscapes that are converted to habitat may no longer convey the
 32 themes of agriculture and settlement, and thus would be inconsistent with remaining features
 33 associated with rural historic landscapes created by reclamation, cultivation, and ranching. These
 34 effects would be material alterations and adverse effects because they would diminish or destroy
 35 the ability of these resources to convey their significance.

36 Because of the large acreages of land included in all conservation measures that would be
 37 implemented under this alternative, it is unlikely that all effects on NRHP-, CRHR-, and /or local
 38 registry-eligible resources and unique archaeological sites could be avoided. Therefore, this impact
 39 would be adverse. Mitigation Measure CUL-7 below addresses this effect.

1 **NEPA Effects:** Implementation of conservation measures will result in ground disturbing work and
 2 introduction of new infrastructure to the Plan Area. These physical modifications may result in
 3 direct effects on NRHP and CRHR eligible resources. These changes may therefore reduce the
 4 integrity of these resources. For these reasons these effects would be adverse.

5 **CEQA Conclusion:** Construction and implementation of conservation measures would result in
 6 ground-disturbing work that could alter the significant characteristics of NRHP, CRHR, and/or local
 7 registry-eligible cultural resources, including prehistoric and historic archaeological sites, TCPs, and
 8 built-environment resources such as historic architectural structures and rural historic landscapes.
 9 The same construction may damage unique archaeological sites. This construction would likely
 10 result in materially adverse changes for the following reasons.

- 11 ● Ground-disturbing construction in archaeological sites disrupts the spatial associations that
 12 contain data useful in research, thus diminishing or destroying the basis for the significance of
 13 the resource.
- 14 ● Ground-disturbing construction may either directly demolish or indirectly affect the setting of
 15 built-environment resources, resulting in an inability of the resource to convey its significance.
- 16 ● Ground-disturbing construction may either directly demolish or change the setting of TCPs
 17 resulting in an inability of the resource to convey its significance.
- 18 ● Ground-disturbing construction may inadvertently disturb human remains.

19 The alteration of a resource that changes the characteristics that convey its significance is a material
 20 alteration under CEQA. The inadvertent disturbance of human remains is a significant impact under
 21 CEQA under the Appendix G checklist. Because this construction would materially alter these
 22 categories of resources and disturb human remains it would result in a significant impact. Mitigation
 23 is available to reduce these impacts by identifying and evaluating resources, avoiding resources
 24 where possible, and developing treatment where avoidance is not possible. In addition construction
 25 would be monitored. However, because of the acreage associated with the proposed restoration
 26 under conservation measures, as well as the multiple constraints associated with other
 27 environmental resources that require mitigation or avoidance, it is unlikely that all cultural
 28 resources could be avoided. Therefore, this impact remains significant and unavoidable.

29 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
 30 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
 31 **Implementation of Conservation Measures 2-22**

32 Please refer to Mitigation Measure CUL-7 above, for Alternative 1A.

33 **Impact CUL-8: Compatibility of the Proposed Water Conveyance Facilities and Other**
 34 **Conservation Measures with Plans and Policies**

35 Constructing the proposed water conveyance facilities (CM1) and implementing CM2–CM22 could
 36 result in the potential for incompatibilities with plans and policies adopted to protect the cultural
 37 resources of the Delta. A number of plans and policies that coincide with the study area provide
 38 guidance for protection of cultural resources as overviewed in Section 18.2.3, Regional and Local
 39 Plans, Policies, and Regulations. This overview of plan and policy compatibility evaluates whether
 40 Alternative 9 is compatible or incompatible with these policies, rather than whether impacts are
 41 adverse or not adverse or significant or less than significant. Because Alternative 9 would result in
 42 the same kinds of effects as Alternative 1A, this alternative is only compatible with some of the land

1 use policies that govern the Plan Area. For policies that emphasize preservation or mitigation the
 2 BDCP will be compatible with these policies because significant cultural resources will be avoided
 3 where feasible, and mitigation will be implemented to reduce effects where avoidance and
 4 preservation is not feasible. For policies that emphasize preservation the BDCP is incompatible in
 5 some instances because multiple constraints governing the location of proposed facilities makes
 6 preservation of all significant cultural resources unlikely. It should be noted that, as described in
 7 *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use regulations.
 8 Furthermore, policy incompatibility, by itself is not a physical impact on the environment.

9 **NEPA Effects:** Because federal agencies are not regulated by local land use policy, the BDCP
 10 alternatives would not result in a conflict with local land use laws for the purposes of NEPA.

11 **CEQA Conclusion:** The Plan Area is governed by cultural resource management policies adopted by
 12 the various counties with jurisdiction in this region. For policies that emphasize preservation or
 13 mitigation the BDCP will be compatible with these policies because DWR and appropriate federal
 14 agencies will implement cultural resource management practices that will identify significant
 15 resources, preserve such resources where feasible, and complete mitigation to reduce significant
 16 effects where preservation is not feasible. For policies that emphasize preservation the BDCP is
 17 incompatible in some instances because multiple constraints governing the location of proposed
 18 facilities makes preservation of all significant cultural resources unlikely. It should be noted that, as
 19 described in *Land Use*, Section 13.2.3, state and federal agencies are not subject to local land use
 20 regulations. Furthermore, policy incompatibility, by itself is not a physical impact on the
 21 environment.

22 18.3.5.17 Cumulative Analysis

23 Assessment Methodology

24 This cumulative impact analysis considers projects that could affect cultural resources within the
 25 same timeframe as the BDCP alternatives, which could result in cumulative effects on cultural
 26 resources. Although cultural resources typically manifest as discrete archaeological sites, structures,
 27 or residences, the combination of projects in the region can result in a cumulative loss of these
 28 resources and associated data potential for archaeological research as well as examples of
 29 significant historical themes and instances of significant engineering or design. In addition, for rural
 30 historic landscapes, historic districts, and other cultural resources that cover large geographic areas,
 31 the combined effects of numerous projects at disparate locations can potentially result in a loss of
 32 integrity that diminishes the quality of the individual resources. This section first analyzes the
 33 cumulative setting, to determine where the range of reasonably foreseeable projects and programs
 34 in the Delta will result in a significant cumulative effect on cultural resources. This range includes
 35 the BDCP. This section then analyzes the contribution of the BDCP to determine if that contribution
 36 is cumulatively considerable.

37 Cumulative Setting

38 The set of programs and projects that would occur within the same timeframe as the BDCP will
 39 collectively result in the cumulative loss of cultural resources. The BDCP will contribute to this loss.
 40 While the various alternatives analyzed above would each affect a slightly different set of resources,
 41 each alternative would result in adverse effects on cultural resources. This setting describes the other
 42 projects that, in combination with the BDCP, will result in adverse effects on cultural resources.

1 Levee repair programs will result in repair and maintenance of existing project levees in the Delta.
2 The construction of upgrades and repair of existing levees will result in ground-disturbing work that
3 has the potential to result in adverse effects on archaeological resources, built-environment
4 structures, and large landscape-level cultural resources such as historic districts, rural historic
5 landscapes, and TCPs. These effects typically occur when construction of setback levees or widening
6 of existing levee prisms disturbs landside archaeological resources, or where borrow activity
7 necessary to provide fill material disturbs the same resources. In addition, maintenance and repair
8 projects can result in the demolition of structures and residences that form portions of rural historic
9 landscapes associated with themes of reclamation and agriculture. Where deep cutoff walls are
10 constructed through existing levee prisms, buried archaeological resources may be damaged or
11 destroyed.

12 Restoration projects may require inundation to enhance wetland and riparian vegetation, which in
13 turn expedites the decay of archaeological resources, and may require demolition of structures and
14 residences in the Delta.

15 Infrastructure projects such as the California High-Speed Rail System, Sacramento to Merced
16 Section, will require ground-disturbing construction along linear corridors where new rail service is
17 placed, resulting in disturbance of archaeological resources and demolition of built-environment
18 resources. Human remains may be encountered and disturbed where they occur as part of larger
19 archaeological sites, or also as discrete burials.

20 Development and plan buildout under general plan blueprints results in the conversion of raw land
21 and the associated disturbance of archaeological resources, buried human remains, and, in some
22 cases, demolition of existing built environment structures and residences.

23 Although project proponents will implement typical mitigation and avoidance measures for most if
24 not all projects occurring as part of the cumulative context, unavoidable effects on cultural resources
25 will nonetheless occur because it is not always feasible to avoid resources. Treatment such as data
26 recovery or documentation cannot replace the lost resource and therefore would not reduce
27 impacts to less-than-significant levels. In addition, archaeological resources are often encountered
28 and damaged inadvertently during construction because these resources cannot be identified before
29 construction takes place.

30 A sample of the projects considered as part of the cumulative context is provided below in Table 18-
31 2. The complete set of projects that form the cumulative context is provided in Appendix 3D,
32 *Defining Existing Conditions, the No Action/No Project Alternative, and Cumulative Impact Conditions.*

1 **Table 18-2. Cumulative Context for Effects on Cultural Resources**

Agency	Program/Project	Status	Description of Program/Project
California Department of Water Resources and Solano County Water Agency	North Bay Aqueduct Alternative Intake Project	Planned action	This project will construct an alternative intake on the Sacramento River and a new segment of pipeline to connect it to the North Bay Aqueduct system, with the possibility of disturbing existing cultural resources.
Reclamation District 2093	Liberty Island Conservation Bank	Planned action	This project includes the restoration of inaccessible, flood prone land zoned as agriculture but not actively farmed, to area enhancement of wildlife resource. Changes in land cover may expedite the decay of existing cultural resources.
California High Speed Rail Authority and Federal Railroad Administration	California High-Speed Rail System, Sacramento to Merced Section	Briefing on Initial Alternatives completed. Sacramento to Merced section is part of Phase 2.	Development of new high-speed rail service will disturb and demolish existing cultural resources.
Bureau of Reclamation	Delta-Mendota Canal/California Aqueduct Intertie	Completed in 2012.	New project facilities include a pipeline and pumping plant that could disturb cultural resources occurring in the path of these features.
SWP/CVP operations	Throughout Plan Area	Continuing actions	Repair and maintenance activities may disturb or demolish cultural resources.
CALFED Levee Stability Program	Existing project levees in the Delta	Continuing actions	Protection of resources in the Delta through maintenance and improvement of existing levees may disturb or demolish cultural resources.
California Department of Water Resources, U.S. Bureau of Reclamation, California Department of Fish and Wildlife	Suisun Marsh Habitat Management, Preservation, and Restoration Plan	Planned Action	Develop a regional plan for Suisun Marsh that balances implementation of the CALFED Program, the Suisun Marsh Preservation Agreement, and other management and restoration programs within the Suisun Marsh in a manner responsive to the concerns of stakeholders and based upon voluntary participation by private landowners.
Delta Wetlands Project	Semitropic Water Storage District	Planned action	Wildlife enhancement on Delta islands may demolish cultural resources or expedite decay of cultural resources.

2

1 **No Action Alternative**

2 The Delta region is rich in prehistoric and historic-era cultural resources. These resources include
 3 prehistoric and historic archaeological sites, buried human remains, and built-environment
 4 resources. Subsidence, levee failure, and climate change all have the potential to increase the
 5 inundation and erosion of cultural resources that currently occur on the landside of existing flood
 6 management structures. Ongoing SWP/CVP operations include both levee repair and habitat
 7 restoration and conservation activities. Where specific projects will result in ground-disturbing
 8 construction these actions have the potential to result in effects on cultural resources through direct
 9 excavation into such resources or the introduction of new inconsistent features such as setback
 10 levees, borrow areas, or other landside features that may not be consistent with the rural
 11 agricultural setting. The plans, programs, and projects that would occur under the No Action
 12 Alternative in addition to the cumulative scenario, collectively will result in adverse effects on
 13 cultural resources. For example, Yolo County concludes in the General Plan Update EIR that plan
 14 buildout will result in significant and unavoidable effects on cultural resources (County of Yolo
 15 2009b:546). Similarly, levee repairs performed in the Delta region in the cumulative No Action
 16 scenario are likely to contribute to effects on archaeological and built-environment resources and
 17 buried human remains because the Delta is sensitive for such resources, and construction of such
 18 improvements would require ground-disturbing work. Habitat restoration in Suisun Marsh or
 19 elsewhere necessary to comply with federal biological opinions could also contribute to effects on
 20 archaeological and built-environment resources and buried human remains. Although mitigation
 21 may be implemented as a part of these ongoing projects, which would reduce their effects, or
 22 manage significant effects through treatment, such treatment typically does not reduce impacts on
 23 cultural resources to less than adverse.

24 The Delta and vicinity is within a highly active seismic area, with a generally high potential for major
 25 future earthquake events along nearby and/or regional faults, and with the probability for such
 26 events increasing over time. Based on the location, extent and non-engineered nature of many
 27 existing levee structures in the Delta area, the potential for significant damage to, or failure of, these
 28 structures during a major local seismic event is generally moderate to high. In the instance of a large
 29 seismic event, levees constructed on liquefiable foundations are expected to experience large
 30 deformations (in excess of 10 feet) under a moderate to large earthquake in the region (see
 31 *Appendix 3E, Potential Seismic and Climate Change Risks to SWP/CVP Water Supplies* for more
 32 detailed discussion). Reclaiming land or rebuilding levees after a catastrophic event due to climate
 33 change or a seismic event could result in the destruction of cultural resources. While similar risks
 34 would occur under implementation of the action alternatives, these risks may be reduced by BDCP-
 35 related levee improvements along with those projects identified for the purposes of flood protection
 36 in Table 18-2.

37 **Impact CUL-9: Potential For the Action Alternatives to Contribute to the Cumulative Loss of** 38 **Cultural Resources in the Plan Area**

39 **Alternatives 1A through 9**

40 The action alternatives vary in terms of location and scale of construction. Tunnel alternatives
 41 would avoid some surface resources where tunnels would replace canals, but would require
 42 construction of large intakes, RTM storage areas, and associated features. Alternatives that would
 43 result in construction of an eastern or western canal would also require construction of large intake
 44 features along the northern end of proposed alignments and would require excavation and borrow

1 activities along the entire footprint. Alternative 9 would have a smaller footprint, but also has the
 2 potential to result in significant and unavoidable effects on cultural resources. All action alternatives
 3 have the potential to result in the following categories of impacts.

- 4 • Demolition or destruction of identified and identifiable archaeological and built-environment
 5 resources that qualify as historical resources, unique archaeological sites, or historic properties.
- 6 • Demolition or destruction of archeological sites that qualify as historical resources, unique
 7 archaeological resources, and historic properties that cannot feasibly be identified in advance of
 8 construction.
- 9 • Demolition or destruction of buried human remains that occur cannot be feasibly be identified
 10 in advance of construction.

11 Because the action alternatives would generate these effects they would make a cumulatively
 12 considerable contribution to a cumulatively significant loss of cultural resources in the Plan Area.
 13 Mitigation Measures CUL-1 through CUL-7 are available to reduce this effect, however, because all
 14 effects cannot be reduced to less than significant, the BDCP would still result in a cumulatively
 15 considerable contribution.

16 **NEPA Conclusion:** Existing and foreseeable projects in the Plan Area will result in adverse effects on
 17 cultural resources. The BDCP alternatives, with the exception of the No Action Alternative, would
 18 create a considerable contribution to this effect. For these reasons this effect would be adverse.

19 **CEQA Conclusion:** The set of projects that would be implemented in the Plan Area during the same
 20 timeframe as the BDCP, including the BDCP, will result in a cumulatively significant loss of cultural
 21 resources. Each of the action alternatives has significant and unavoidable effects on identified and
 22 identifiable archaeological resources and built-environment resources. In addition each action
 23 alternative has the potential to result in significant and unavoidable effects on buried human
 24 remains and buried archaeological sites that cannot feasibly be identified in advance of construction.
 25 Therefore, the action alternatives would each make a cumulatively significant contribution to a
 26 cumulatively significant loss of cultural resources.

27 **Mitigation Measure CUL-1: Prepare a Data Recovery Plan and Perform Data Recovery**
 28 **Excavations on the Affected Portion of the Deposits of Identified and Significant**
 29 **Archaeological Sites**

30 Please see Mitigation Measure CUL-1 under Impact CUL-1 in the discussion of Alternative 1A.

31 **Mitigation Measure CUL-2: Conduct Inventory, Evaluation, and Treatment of**
 32 **Archaeological Resources**

33 Please see Mitigation Measure CUL-2 under Impact CUL-2 in the discussion of Alternative 1A.

34 **Mitigation Measure CUL-3: Implement an Archaeological Resources Discovery Plan,**
 35 **Perform Training of Construction Workers, and Conduct Construction Monitoring**

36 Please see Mitigation Measure CUL-3 under Impact CUL-3 in the discussion of Alternative 1A.

1 **Mitigation Measure CUL-4: Follow State and Federal Law Governing Human Remains if**
 2 **Such Resources Are Discovered during Construction**

3 Please see Mitigation Measure CUL-4 under Impact CUL-4 in the discussion of Alternative 1A.

4 **Mitigation Measure CUL-5: Consult with Relevant Parties, Prepare and implement a Built**
 5 **Environment Treatment Plan**

6 Please see Mitigation Measure CUL-5 under Impact CUL-5 in the discussion of Alternative 1A.

7 **Mitigation Measure CUL-6: Conduct a Survey of Inaccessible Properties to Assess**
 8 **Eligibility, Determine if These Properties Will Be Adversely Impacted by the Project, and**
 9 **Develop Treatment to Resolve or Mitigate Adverse Impacts**

10 Please see Mitigation Measure CUL-6 under Impact CUL-6 in the discussion of Alternative 1A.

11 **Mitigation Measure CUL-7: Conduct Cultural Resource Studies and Adopt Cultural**
 12 **Resource Mitigation Measures for Cultural Resource Impacts Associated with**
 13 **Implementation of Conservation Measures 2–22**

14 Please see Mitigation Measure CUL-7 under Impact CUL-7 in the discussion of Alternative 1A.

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