

3.0 Environmental Setting, Impacts, and Mitigation Measures

This chapter describes the approach to the CVFPP environmental analysis and, for each environmental resource area, details the existing conditions in the study area, analyzes the environmental impacts of the CVFPP, and presents mitigation measures for significant and potentially significant impacts.

3.1 Approach to Environmental Analysis

An environmental document prepared to comply with CEQA must identify the significant environmental effects of a project. A “[s]ignificant effect on the environment” means a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project (CEQA Guidelines, California Code of Regulations (CCR) Title 14, Section 15382). This EIR is a “program” EIR (PEIR) intended to provide information at a general (or programmatic) level of detail on the potential impacts of implementing the CVFPP. In addition, subsequent implementation actions stemming from adoption of the proposed program would involve additional project-level environmental review and documentation to the extent required by CEQA and the CEQA Guidelines.

3.1.1 Section Contents

Sections 3.2 through 3.21 of this PEIR follow the same general format and are each organized into the major components described below.

Environmental Setting

The “Environmental Setting” section describes the physical environmental conditions assumed in this PEIR for analyzing the effects of the CVFPP. The environmental setting generally consists of the existing physical environment as of October 27, 2010, the date when DWR published the notice of preparation (NOP) to prepare an EIR for the CVFPP and filed it with the State Clearinghouse. Under CEQA, baseline environmental conditions are typically set at the time the NOP is published (CEQA Guidelines, Section 15125(a)). However, baseline information may describe conditions at a different time, such as if the most recent data available are from a year before the NOP was published.

1 **Regulatory Setting**

2 The “Regulatory Setting” section describes the federal, State, regional, and
3 local laws, regulations, plans, and ordinances relevant to the CVFPP.

4 **Analysis Methodology and Thresholds of Significance**

5 This section describes the methods, process, procedures, and/or
6 assumptions used to formulate and conduct the impact analysis. It also
7 presents the significance criteria (or “thresholds of significance”) used to
8 define the level at which an impact would be considered significant in
9 accordance with CEQA. Thresholds may be quantitative or qualitative;
10 they may be based on agency or professional standards or on legislative or
11 regulatory requirements relevant to the impact analysis. Generally, the
12 thresholds of significance are derived from Appendix G of the CEQA
13 Guidelines, as amended; factual or scientific information and data; and
14 regulatory standards.

15 **Environmental Impacts and Mitigation Measures**

16 This analysis examines all potentially significant impacts that would occur
17 with implementation of the CVFPP. Impacts and mitigation measures are
18 described for near-term management activities (NTMAs) and long-term
19 management activities (LTMAs). NTMAs are those management activities
20 that would be initiated during the first 5 years after approval of the CVFPP,
21 with many having the potential to be completed during that initial period;
22 LTMAs are management activities that would be initiated and implemented
23 at any time beyond 5 years after adoption of the CVFPP.

24 The CVFPP is a broad-based, complex program intended to be
25 implemented over time. Ninety-four management actions have been
26 identified that are intended to serve as the building blocks for the program
27 as it evolves. The NTMAs are generally more foreseeable because they are
28 mostly continuations of activities that are currently under way, or reflect
29 activities that are currently in the project-level planning process. It is
30 reasonably foreseeable that many NTMAs will continue beyond 5 years,
31 but the precise nature of LTMAs becomes less predictable. Nonetheless,
32 certain activities can be foreseen with sufficient clarity over the long term
33 that they are amenable to an environmental evaluation that assesses the
34 potential significance of the impacts and identifies associated mitigation
35 measures. The program comprehensively analyzes all available options for
36 flood risk reduction; therefore, it also includes the possibility of certain
37 activities that are by their nature speculative at this time, the feasibility of
38 which may be limited by economic, practical, political, legal,
39 environmental, or other factors. Given this range in foreseeability of the
40 various management activities, the analysis has been prepared in a way that
41 best matches the activities with the currently foreseeable level of detail for

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1 those activities and the resulting level of environmental analysis that can be
2 undertaken.

3 NTMAs and LTMAs are discussed further below in Section 3.1.2,
4 “Analysis Methodology,” and are described in more detail in Section 2.4,
5 “Proposed Management Activities.”

6 Impacts and mitigation measures are numbered sequentially in each
7 resource section, and mitigation measures correspond to the impact being
8 addressed. For instance, impacts in Section 3.3, “Agriculture and Forestry
9 Resources,” are numbered Impact AG-1, and Mitigation Measure AG-1
10 corresponds with Impact AG-1. Each impact and mitigation measure
11 number is followed by the designation “(NTMA)” or “(LTMA)” to indicate
12 whether the impact or mitigation measure is associated with an NTMA or
13 an LTMA. An impact title precedes the analysis of the impact. Where two
14 or more distinct mitigation measures apply to the same impact, a letter
15 subdesignation is provided; for example, Mitigation Measure AG-1a
16 (NTMA) and Mitigation Measure AG-1b (NTMA) both apply to Impact
17 AG-1 (NTMA). The discussion that follows the impact title includes
18 information to support the significance conclusion stated in boldface at the
19 end of the impact discussion.

20 Following each discussion of a significant or potentially significant impact,
21 any available and feasible mitigation measures are provided to avoid,
22 minimize, rectify, or reduce the significant or potentially significant
23 impacts to a less-than-significant level. In accordance with California
24 Public Resources Code (PRC) Section 21081.6(b), mitigation measures
25 must be fully enforceable through permit conditions, agreements, other
26 legally binding instruments, or by incorporating the measures into the
27 project design. Section 15370 of the CEQA Guidelines defines mitigation
28 as any of the following:

- 29 • Avoiding the impact altogether by not taking a certain action or parts of
30 an action
- 31 • Minimizing impacts by limiting the degree or magnitude of the action
32 and its implementation
- 33 • Rectifying the impact by repairing, rehabilitating, or restoring the
34 impacted environment
- 35 • Reducing or eliminating the impact over time by preservation and
36 maintenance operations during the life of the action

- 1 • Compensating for the impacts by replacing or providing substitute
2 resources or environments

3 Where applicable to the environmental resource area, after the presentation
4 of typical impacts and mitigation measures to evaluate NTMAs and
5 LTMAs, a narrative discussion describes any other LTMA impacts that
6 could occur, but are too general and conceptual to evaluate using the
7 standard “impact/mitigation” approach. This narrative approach to LTMA
8 impact discussions is described in more detail below in Section 3.1.2,
9 “Analysis Methodology.”

10 **3.1.2 Analysis Methodology**

11 ***Definition of NTMAs and LTMAs***

12 As described above, environmental impacts are evaluated for both NTMAs
13 and LTMAs. The impact analysis addresses construction, operations and
14 maintenance, and policy actions for both activity categories. Construction-
15 related, operational, and maintenance-related impacts result in direct and
16 indirect impacts, while policy actions result only in indirect impacts.
17 (Direct and indirect impacts are defined below in Section 3.1.4, “Impact
18 Mechanisms.”)

19 In each impact analysis section, NTMAs are evaluated at a greater level of
20 specificity than LTMAs for the following reasons:

- 21 • NTMAs are better defined and less conceptual than LTMAs, are more
22 likely to be implemented in the short term (within the first 5 years after
23 approval of the CVFPP), and are generally less complex.
- 24 • NTMAs have more secure funding sources than LTMAs.
- 25 • Environmental impacts of NTMAs can generally be evaluated more
26 accurately than impacts of LTMAs.

27 However, both NTMAs and LTMAs are evaluated at a “program” level of
28 detail consistent with the guidance on program EIRs provided in Section
29 15168 of the CEQA Guidelines.

30 NTMAs can consist of any of the following types of activities:

- 31 • Conveyance management activities:
- 32 – Sediment removal
- 33 – Levee repair, reconstruction, and/or improvements:

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- 1 ○ Raise levees by adding earthen material or constructing
2 floodwalls.
- 3 ○ Strengthen levees to enhance their integrity by improving the
4 properties and geometry of embankment soils to resist slope and
5 seepage failures.
- 6 ○ Address seepage with seepage berms, stability berms,
7 impermeable barrier curtains (slurry cutoff walls) in the levee
8 and/or its foundation, and relief wells and toe drains.
- 9 ○ Armor the landside of the levees to improve levee resiliency
10 during overtopping episodes.
- 11 ○ Construct small setback levees (generally less than 0.75 mile
12 long).
- 13 ● Storage management activities:
 - 14 – Change reservoir operations criteria to alter the timing, magnitude,
15 and frequency of flood releases to downstream channels, providing
16 reductions in river flood stage and volume.
 - 17 ○ Coordinate operation among different reservoirs to increase
18 objective releases from reservoirs.
 - 19 ○ More effectively use weather forecasting in conjunction with
20 reservoir operations.
 - 21 ○ Use weather forecasting to support more flexibility in short-
22 term allocations of available storage space between water
23 supply and flood control.
- 24 ● Other management activities:
 - 25 – Implement the vegetation management strategy.
 - 26 – Purchase floodplain easements and/or other interests in land.
 - 27 – Integrate conservation strategies into all implementation actions to
28 improve the overall sustainability of, and ecosystem benefits
29 provided by, the flood management system.
 - 30 – Refine flood emergency response, improve flood system operations
31 and maintenance, continue floodplain risk management, conduct

1 feasibility studies, and implement flood risk reduction projects in
2 coordination and partnership with local and federal agencies.

3 All other types of CVFPP activities fall within the LTMA category and
4 consist of the following types of activities:

- 5 • Widening floodways (through setback levees and/or purchase of
6 easements)
- 7 • Constructing weirs and bypasses
- 8 • Improving and remediating levees
- 9 • Constructing new levees
- 10 • Removing some facilities from the SPFC
- 11 • Using long-term forecasts to improve operation of existing reservoirs
- 12 • Achieving protection of urban areas from a flood event with 0.5 percent
13 risk of occurrence in any given year
- 14 • Achieving protection of small communities from a flood event with 1
15 percent risk of occurrence in any given year
- 16 • Protecting rural-agricultural area against floods by facilitating
17 inspection and flood fighting, improving levee performance, and
18 purchasing agricultural easements
- 19 • Changing policies, guidance, standards, and institutional structures
- 20 • Implementing additional and ongoing conservation elements

21 However, because NTMA-type activities would continue to be
22 implemented in the CVFPP study area into the longer term time frame of
23 the LTMA's (e.g., remediation of existing levees), LTMA's include a
24 continuation of activities described as part of the NTMA's.

25 ***Approach to Impacts and Mitigation Measures***

26 NTMA's are evaluated first in each impact analysis section using a typical
27 "impact/mitigation" approach. LTMA's are then evaluated. Where impact
28 descriptions and mitigation measures identified for NTMA's also apply to
29 LTMA's, they are also attributed to the LTMA's, with modifications or
30 expansions as needed. In addition, in some cases, LTMA's could have
31 impacts and require mitigation measures not previously addressed in the

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1 discussion of NTMAs. In these cases, additional impacts and mitigation
2 measures specific to LTMAAs are provided.

3 For each impact discussion, the environmental effect is determined to be
4 either less than significant, significant, potentially significant, or beneficial
5 compared to existing conditions and relative to the thresholds of
6 significance. Definitions for each impact category are provided below in
7 Section 3.1.3, “Terminology Used to Describe Impacts.”

8 Feasible mitigation measures are identified to address impacts identified as
9 significant or potentially significant. The specificity of the mitigation
10 measures is consistent with the broad, program-level nature of the CVFPP
11 and the parallel program-level analysis in this PEIR. Mitigation measures
12 identified in this PEIR would be applied as appropriate to specific future
13 projects implemented under the CVFPP. When project-specific CEQA
14 analyses are conducted for future projects, mitigation measures in this
15 PEIR would be incorporated as applicable into the CEQA document and
16 would be used to guide the development of project-specific mitigation
17 measures.

18 Actual implementation, monitoring, and reporting of the PEIR mitigation
19 measures would be the responsibility of the project proponent for each site-
20 specific project. For those projects not undertaken by, or otherwise subject
21 to the jurisdiction of, DWR or the Central Valley Flood Protection Board
22 (Board), the project proponent generally can and should implement all
23 applicable and appropriate mitigation measures. The project proponent is
24 the entity with primary responsibility for implementing specific future
25 projects and may include DWR; the Board; reclamation districts; local
26 flood control agencies; and other federal, State, or local agencies. The
27 project proponent may also be the CEQA lead agency for future site-
28 specific projects.

29 Because various agencies may ultimately be responsible for implementing
30 (or ensuring implementation of) mitigation measures identified in this
31 PEIR, the text describing mitigation measures does not refer directly to
32 DWR but instead refers to the “project proponent.” This term is used to
33 represent all potential future entities responsible for implementing, or
34 ensuring implementation of, mitigation measures.

35 ***LTMA Narrative Analysis Approach***

36 Because of the more general and conceptual nature of many LTMAAs, a
37 great deal of uncertainty exists about how some LTMAAs may be
38 implemented and what environmental effects might result from their
39 implementation. This uncertainty is to be expected for a broad, multiyear,
40 and in some areas, conceptual program such as the CVFPP. However, this

1 uncertainty also makes the use of a standard “impact/mitigation” approach
2 unsuitable for some elements of the LTMA analysis. Therefore, in some
3 sections of this PEIR, additional impacts of LTMA (beyond the standard
4 “impact/mitigation” approach) are described in a broader narrative format,
5 along with lists of suggested mitigation strategies provided that could be
6 applied to these impacts. The approach and methodology for these broader
7 narrative LTMA impact discussions are described below.

8 At the current stage of program development, no commitments have been
9 made and little specificity exists (e.g., regarding location, size, or
10 operational criteria) for several categories of LTMA, such as widening
11 floodways and new flood bypasses. For many categories of LTMA, a
12 substantial future study would be required to determine whether
13 implementing such an LTMA in a particular location would be feasible
14 economically, environmentally, legally, socially, or technologically, or
15 based on other considerations. In addition, without further detail about the
16 location, design, and operational criteria of potential LTMA, a great deal
17 of speculation could be required in some instances to assess environmental
18 effects, determine the level of significance of these effects, and determine
19 whether feasible mitigation is available to fully address significant effects.

20 Although these uncertainties exist, sufficient information often exists to at
21 least disclose additional potential impacts of LTMA besides those
22 discussed in the impact/mitigation pairings provided earlier in each analysis
23 section. Therefore, in many instances, additional LTMA impacts are
24 described in a broad narrative format; because of the uncertainty
25 surrounding these impacts, no determination regarding their significance is
26 provided. Consistent with Section 15145 of the CEQA Guidelines, these
27 impacts are too speculative for evaluation beyond the narrative disclosure
28 provided. The speculative nature of an impact may be related to uncertainty
29 about factors such as the following:

- 30 • The LTMA itself (e.g., Where might it be implemented? How might it
31 be implemented? Is it feasible?)
- 32 • The nature of the impact (e.g., Would changes in flows be sufficient to
33 result in substantial downstream erosion?)
- 34 • The availability of mitigation and its effectiveness

35 Future project-specific CEQA evaluations for individual LTMA will be
36 used to determine the potential for the narratively described impacts to
37 occur, determine their level of significance, and identify project-specific
38 mitigation measures for significant impacts.

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1 Narrative impact discussions are divided among the geographic areas in the
2 program study area (i.e., the extended systemwide planning area,
3 Sacramento and San Joaquin Valley watersheds, and Southern
4 California/coastal Central Valley Project/State Water Project service areas).
5 They are further subdivided according to the type of action (i.e.,
6 construction of storage and conveyance facilities, facilities operations and
7 maintenance from storage or conveyance actions, and other management
8 actions).

9 Examples of potential mitigation strategies are provided after the narrative
10 impact discussions to disclose the nature and extent of mitigation actions
11 that might be necessary to address the impacts. The mitigation strategies
12 may be considered, as applicable, during project-level evaluation of
13 specific LTMA. Not all mitigation strategies will apply to all LTMA; the
14 applicability of mitigation strategies will vary based on the location,
15 timing, and nature of each LTMA. In addition, some mitigation strategies
16 on their own do not constitute sufficient mitigation under CEQA (e.g.,
17 simply conducting surveys) but must be coupled with other mitigation
18 strategies to adequately address the impacts of LTMA.

19 3.1.3 Terminology Used to Describe Impacts

20 The PEIR uses the following CEQA terminology to denote the significance
21 of environmental impacts:

- 22 • **No impact** indicates that the construction, operations, and maintenance
23 of the CVFPP would not have any direct or indirect impacts on the
24 physical environment. It means that no change from existing conditions
25 would result. This impact level does not require mitigation.
- 26 • A **less-than-significant impact** is one that would not result in a
27 substantial or potentially substantial change in the physical
28 environment. This impact level does not require mitigation, even if
29 applicable measures are available; however, measures may be
30 recommended to further reduce less-than-significant impacts.
- 31 • A **significant impact** is defined by PRC Section 21068 as one that
32 would cause “a substantial, or potentially substantial, adverse change in
33 any of the physical conditions within the area affected by the project.”
34 Under CEQA, mitigation measures and alternatives must be identified,
35 where applicable and feasible, to avoid, minimize, rectify, compensate,
36 or reduce significant impacts to a less-than-significant level.
37 Alternatives to the CVFPP are discussed in Chapter 5.0, “Alternatives.”
- 38 • A **potentially significant impact** is one that, if it were to occur, would
39 be considered a significant impact as described above; however, the

1 occurrence of the impact cannot be immediately determined with
2 certainty. For CEQA purposes, a potentially significant impact is
3 treated as if it were a significant impact. Therefore, under CEQA,
4 mitigation measures and alternatives must be identified, where feasible,
5 to avoid, minimize, rectify, compensate, or reduce significant impacts
6 to a less-than-significant level.

- 7 • A **significant and unavoidable impact** is one that would result in a
8 substantial adverse effect on the physical environment and that cannot
9 be reduced to a less-than-significant level even with implementation of
10 any applicable feasible mitigation. Under CEQA, a project with
11 significant and unavoidable impacts may proceed, but the CEQA lead
12 agency (DWR) would be required to (1) conclude in findings that there
13 are no feasible means of substantially lessening or avoiding the
14 significant impact in accordance with the CEQA Guidelines (14 CCR
15 Sections 15091(a)(3)) and (2) prepare a statement of overriding
16 considerations, in accordance with the CEQA Guidelines (14 CCR
17 Section 15093), explaining why the CEQA lead agency has chosen to
18 proceed with the project in spite of the potential for significant impacts
19 on the physical environment.
- 20 • A **potentially significant and unavoidable impact** is one that, if it
21 were to occur, would be considered a significant and unavoidable
22 impact as described above; however, there is uncertainty regarding the
23 occurrence or severity of the impact and/or the inability of mitigation
24 measures to reduce the impact to a less-than-significant level.
25 For CEQA purposes, a potentially significant and unavoidable impact is
26 treated as if it were significant and unavoidable, and findings and a
27 statement of overriding considerations must be prepared as described
28 above.
- 29 • An impact may have a level of significance that is too uncertain to be
30 reasonably determined and would therefore be considered **too**
31 **speculative for meaningful consideration** in accordance with the
32 CEQA Guidelines (14 CCR Section 15145). Where some degree of
33 evidence points to the reasonable potential for a significant effect, the
34 EIR may explain that a determination of significance is uncertain, but is
35 still assumed to be “potentially significant,” as described above. In
36 other circumstances, after thorough investigation, the determination of
37 significance may still be considered too speculative to be meaningful.
38 This is an effect for which the degree of significance cannot be
39 determined for specific reasons, such as unpredictability of the
40 occurrence or severity of the impact, lack of methodology to evaluate
41 the impact, or lack of an applicable significance threshold.

- 1 • A **beneficial effect** is one that would result in a positive change in any
2 of the physical conditions within the area affected by the CVFPP.

3 **3.1.4 Impact Mechanisms**

4 Mechanisms that could cause impacts are discussed for each resource area.
5 General categories of impact mechanisms are project construction and
6 activities related to future operations and maintenance, as described in
7 Chapter 2.0, “Program Description.”

8 Project impacts are effects that are categorized, pursuant to CEQA, to
9 describe their context and intensity. Project effects fall into the following
10 categories:

- 11 • A **temporary impact** would occur only during construction.
- 12 • A **short-term impact** would last from the time construction ceases to
13 within 3 years after construction.
- 14 • A **long-term impact** would last longer than 3 years after construction.
15 In some cases, a long-term impact could be considered a permanent
16 impact.
- 17 • A **direct impact** is an impact that would be caused by an action and
18 would occur at the same time and place as the action.
- 19 • An **indirect impact** is an impact that would be caused by an action but
20 would occur later in time or at a distance that is removed from the
21 impact area, but is reasonably foreseeable, such as growth-inducing
22 effects and other changes related to changes in land use patterns and
23 related effects on the physical environment.
- 24 • A **residual impact** is an impact that would remain after implementation
25 of mitigation. This type of impact is not defined in the CEQA
26 Guidelines.
- 27 • A **cumulative impact** refers to two or more individual effects that,
28 when considered together, are considerable or that compound or
29 increase other environmental impacts. “Cumulatively considerable”
30 means that the incremental effects of an individual project, even if
31 individually limited, are considerable when viewed in connection with
32 the effects of past projects, the effects of other current projects, and the
33 effects of probable future projects. Cumulative impacts are discussed in
34 Chapter 4.0, “Cumulative Impacts.”

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