

## **Environmental Commitments, AMMs, and CMs**

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## Appendix 3B

# Environmental Commitments, AMMs, and CMs

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### 3B.1 Effectiveness of Environmental Commitments

This appendix presents environmental commitments that are incorporated into all of the action alternatives (i.e., all alternatives except for the No Action/No Project Alternative). Like the formal mitigation measures prescribed in the EIR/EIS, these environmental commitments, which sometimes take the form of best management practices (BMPs), were intended to avoid or minimize potential adverse effects (a NEPA term) and potential significant impacts (a CEQA term). Table 3B-1 identifies each environmental impact (e.g., Impact WQ-31, Impact SOILS-1) to which particular commitments are relevant, so that readers would know which impacts would be rendered less severe by implementing these commitments.

The State CEQA Guidelines instruct lead agencies, in their EIRs, to “distinguish between the measures which are proposed by project proponents to be included in the project and other measures proposed by the lead, responsible or trustee agency or other persons[.]”<sup>1</sup> The NEPA Regulations adopted by the Council on Environmental Quality similarly instruct federal lead agencies to include within their EISs “appropriate mitigation measures not already included in the proposed action or alternatives.”<sup>2</sup> For many kinds of projects, particularly those involving private applicants seeking governmental approvals subject to CEQA or NEPA, there is an important distinction between mitigation measures that are proposed by the applicant or are part of the project, and mitigation measures that are recommended by the lead agency or other agencies. CEQA case law highlights this distinction by noting that proposed mitigation measures found in an EIR are only “‘suggestions which may or may not be adopted by decision makers’.”<sup>3</sup> At the time of project approval these decision makers have the option, if supported by substantial evidence, of rejecting proposed mitigation measures as infeasible.<sup>4</sup> Under CEQA, there is also an important distinction between mitigation measures that a lead agency could impose and measures that would have to be imposed, if at all, by one or more responsible agencies.<sup>5</sup>

With these distinctions in mind, the California Department of Water Resources (DWR), as both CEQA lead agency and a project proponent, elected to clearly distinguish between environmental commitments and mitigation measures. The emphasis on environmental commitments was intended to reassure readers that DWR was unambiguously committed to carrying out a large number of practices or BMPs that would be effective either in reducing significant environmental effects to less-than-significant or less-than-adverse levels or in reducing the severity of such impacts to some substantial degree. By labeling these practices *environmental commitments* rather than *mitigation measures*, DWR intended to dispel any concern that the practices and BMPs designated as environmental commitments might be rejected as infeasible at the time of project approval or could

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<sup>1</sup> State CEQA Guidelines, § 15126.4[a][1][A].

<sup>2</sup> 40 CFR § 1502.14[f]. See also *id.*, § 1502.16[h].

<sup>3</sup> See *Native Sun/Lyon Communities v. City of Escondido* (1993) 15 Cal.App.4th 892, 908.

<sup>4</sup> Cal. Pub. Resources Code, § 21081[a][3].

<sup>5</sup> Compare Cal. Pub. Resources Code, § 21081[a][1] with *id.*, § 21081[a][2].

not be imposed by the lead agencies but rather had to await action by state responsible agencies or federal permitting agencies.

Both DWR and the federal lead agencies were aware that, in many instances, the environmental commitments functioned as *de facto* mitigation measures. The EIR/EIS is therefore written with a recognition that, where appropriate and necessary, its text should explain how the environmental commitments would function, and whether particular commitments would or would not be effective in reducing various significant or adverse effects to less-than-significant or less-than-adverse levels. The lead agencies intended that, when read together with Table 3B-1, these textual passages would provide sufficient explanation and evidence to justify reliance on the environmental commitments as feasible means to reduce the severity of environmental effects.

Despite these efforts in the Draft EIR/EIS, which was issued for public review in December 2013, several commenters have asserted that the document did not comply with the requirements subsequently announced by the California Court of Appeal in a January 2014 decision known as *Lotus v. Department of Transportation*.<sup>6</sup> That case generally lays out principles that CEQA lead agencies should follow with respect to “‘avoidance, minimization and/or mitigation measures’ that ‘have been incorporated into the project to avoid and minimize impacts as well as to mitigate expected impacts.’”<sup>7</sup> In general, lead agencies must not simply assume, without analysis, that such project features will be effective in avoiding or minimizing significant environmental effects. Rather, such project features should be discussed in a manner similar to that required for formally proposed mitigation measures. In other words, for the significant environmental effects at issue, the EIR should do the following: state whether, in the absence of such features, impacts would be significant; and explain, in light of the applicable significance thresholds, whether the project features would or would not be sufficient to render the effects less than significant.<sup>8</sup> Such project features should also be made enforceable through some means at the time of project approval.<sup>9</sup>

In response to comments contending that DWR, as lead agency, had failed to comply with the *Lotus* decision, DWR along with the Bureau of Reclamation, as federal lead agency, have modified Appendix 3B. In addition to the refinements made to some of the environmental commitments, Appendix 3B as modified now includes, after each specific environmental commitment, one or more narrative discussions explaining both how it reduces the severity of environmental effects and whether the level of impact reduction is sufficient to render the effects less than significant. This approach provides a succinct presentation and analysis of each environmental commitment’s effectiveness in reducing environmental impacts in a comprehensive and understandable manner without reproducing all the original Draft EIR/EIS impact discussions that reference environmental commitments. The lead agencies are cognizant of the size of the Draft EIR/EIS, which was the subject of many comments on the document, and opted to take an approach intended to minimize the burdens placed on readers.

Additionally, in recognition of the fact that many of the Avoidance and Minimization Measures (AMMs) that were initially proposed as a part of the project, as well as certain Conservation

<sup>6</sup> 223 Cal.App.4th 645.

<sup>7</sup> 223 Cal.App.4th 650.

<sup>8</sup> Id. at p. 656.

<sup>9</sup> Id. at p. 656.

Measures (CMs) are utilized by the action alternatives to mitigate effects, those AMMs and CMs,<sup>10</sup> which also serve as *de facto* mitigation for various resource impacts within this document have been added to this appendix. This appendix has been renamed to reflect the addition of this discussion.

## 3B.2 Environmental Commitments

As part of the planning and environmental assessment process, the project proponents will incorporate the following environmental commitments and best management practices (BMPs) into the action alternatives to avoid or minimize potential adverse effects (a NEPA term) and potential significant impacts (a CEQA term). The project proponents will implement these environmental commitments as part of the project construction activities. In other words, these commitments will be satisfied even if not separately imposed by the permitting agencies. If permitting agencies impose additional measures or modifications, those will also be adhered to as part of the permit(s). The project proponents will coordinate planning, engineering, design and construction, operation, and maintenance phases of the alternative with the appropriate agencies.

An environmental permitting coordinator will consult with permitting agencies and local agencies to ensure that the environmental commitments described in this appendix are implemented. Where applicable, DWR will follow a local agency's policies where DWR determines such policies to be appropriate and feasible. As CEQA lead agency, DWR will include these commitments in the Mitigation Monitoring and Reporting Plan for the project to ensure implementation of the commitments during project construction and operation.

The following environmental commitments have been incorporated into the action alternatives and apply to the water conveyance facilities and project conservation components. Consequently, they are not restated in the impact analysis for each resource chapter but instead are incorporated by reference. The project proponents will ensure that these measures are implemented depending on the location of construction and surrounding land uses. Table 3B-1 summarizes resource area impacts associated with environmental commitment(s).

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<sup>10</sup> For the non-HCP alternatives, these conservation measures are referred to as *Environmental Commitments* with numbers that correspond to the parallel BDCP conservation measures. This discussion should be considered to apply to these Environmental Commitments as well, even though only the terminology for the HCP alternatives is utilized.

1 **Table 3B-1. Summary of Environmental Commitments**

Environmental Commitments	Chapter/Resource	Alternative	Impact	
Perform Geotechnical Studies	Ch. 7, Groundwater	1A-9 (except where noted)	Impact GW-3	Impact GEO-11
	Ch. 9, Geology and Seismicity		Impact GW-5	(1B, 1C, 2B, 2C, 6B, 6C only)
	Ch. 10, Soils		Impact GEO-2	Impact GEO-12
			Impact GEO-3	Impact GEO-13
			Impact GEO-4	Impact GEO-14
			Impact GEO-5	Impact GEO-15
			Impact GEO-6	Impact SOILS-3
			Impact GEO-7	Impact SOILS-4
			Impact GEO-8	Impact SOILS-8
			Impact GEO-9	Impact SOILS-9
			Impact GEO-10	
Conform with Applicable Design Standards and Building Codes	Ch. 7, Groundwater	1A-9 (except where noted)	Impact GW-5	Impact GEO-11
	Ch. 9, Geology and Seismicity		Impact GEO-1	(1B, 1C, 2B, 2C, 6B, 6C only)
	Ch. 10, Soils		Impact GEO-2	Impact GEO-12
			Impact GEO-3	Impact GEO-13
			Impact GEO-4	Impact GEO-14
			Impact GEO-5	Impact GEO-15
			Impact GEO-6	Impact SOILS-3
			Impact GEO-7	Impact SOILS-4
			Impact GEO-8	Impact SOILS-8
			Impact GEO-9	Impact SOILS-9
			Impact GEO-10	
Electrical Power Guidelines	Ch. 12, Terrestrial Biological Resources	1A-8	Impact BIO-21	
	Ch. 25, Public Health		Impact BIO-68	
			Impact BIO-71	
			Impact BIO-173	
			Impact PH-4	
Electrical Power Line Support Placement	Ch. 14, Agricultural Resources	1A-9	Impact AG-1	
	Ch. 17, Aesthetics and Visual Resources		Impact AES-6	

Environmental Commitments	Chapter/Resource	Alternative	Impact	
Develop and Implement Stormwater Pollution Prevention Plans	Ch. 7, Groundwater	1A-9	Impact GW-3	Impact AQUA-163
	Ch. 8, Water Quality		Impact WQ-31	Impact AQUA-164
	Ch. 10, Soils		Impact SOILS-1	Impact AQUA-169
	Ch. 11, Fish and Aquatic Resources		Impact SOILS-6	Impact AQUA-181
	Ch. 12, Terrestrial Biological Resources		Impact AQUA-1	Impact AQUA-182
	Ch. 15, Recreation		Impact AQUA-2	Impact AQUA-187
	Ch. 20, Public Services and Utilities		Impact AQUA-7	Impact AQUA-199
	Ch. 24, Hazards and Hazardous Material		Impact AQUA-19	Impact AQUA-200
	Ch. 25, Public Health		Impact AQUA-20	Impact AQUA-205
	Ch. 28, Environmental Justice (Impact HAZ-2)		Impact AQUA-25	Impact AQUA-146
			Impact AQUA-37	Impact BIO-3
			Impact AQUA-38	Impact BIO-5
			Impact AQUA-43	Impact BIO-8
			Impact AQUA-44	Impact BIO-11
			Impact AQUA-55	Impact BIO-14
			Impact AQUA-56	Impact BIO-17
			Impact AQUA-61	Impact BIO-20
			Impact AQUA-62	Impact BIO-23
			Impact AQUA-73	Impact BIO-26
			Impact AQUA-74	Impact BIO-28
			Impact AQUA-79	Impact BIO-31
			Impact AQUA-89	Impact REC-4
			Impact AQUA-91	Impact REC-9
			Impact AQUA-92	Impact UT-4
			Impact AQUA 97	Impact HAZ-1
			Impact AQUA-109	Impact HAZ-2
			Impact AQUA-110	Impact HAZ-6
			Impact AQUA-115	Impact HAZ-7
			Impact AQUA-127	Impact PH-3
			Impact AQUA-128	Impact PH-7
			Impact AQUA-145	Impact PH-9
			Impact AQUA-151	

Environmental Commitments	Chapter/Resource	Alternative	Impact	
Develop and Implement Erosion and Sediment Control Plans	Ch. 8, Water Quality	1A-9	Impact WQ-31	Impact AQUA-110
	Ch. 9, Geology and Seismicity		Impact GEO-15	Impact AQUA-115
	Ch. 10, Soils		Impact SOILS-1	Impact AQUA-127
	Ch. 11, Fish and Aquatic Resources		Impact SOILS-6	Impact AQUA-128
	Ch. 15, Recreation		Impact AQUA-1	Impact AQUA-145
	Ch. 16, Socioeconomics		Impact AQUA-2	Impact AQUA-146
	Ch. 19, Transportation		Impact AQUA-7	Impact AQUA-151
	Ch. 20, Public Services and Utilities		Impact AQUA-19	Impact AQUA-163
	Ch. 25, Public Health		Impact AQUA-20	Impact AQUA-164
			Impact AQUA-37	Impact AQUA-169
			Impact AQUA-38	Impact AQUA-181
			Impact AQUA-43	Impact AQUA-182
			Impact AQUA-44	Impact AQUA-187
			Impact AQUA-55	Impact AQUA-199
			Impact AQUA-56	Impact AQUA-200
			Impact AQUA-61	Impact AQUA-205
			Impact AQUA-62	Impact REC-4
			Impact AQUA-73	Impact REC-9
			Impact AQUA-74	Impact ECON-3
			Impact AQUA-79	Impact ECON-15
			Impact AQUA-89	Impact TRANS-14
			Impact AQUA-91	Impact UT-4
			Impact AQUA-92	Impact PH-3
			Impact AQUA-97	Impact PH-7
			Impact AQUA-109	Impact PH-9

Environmental Commitments	Chapter/Resource	Alternative	Impact	
Develop and Implement Fish Rescue and Salvage Plans	Ch. 11, Fish and Aquatic Resources Ch. 15, Recreation	1A-9	Impact AQUA-1	Impact AQUA-110
			Impact AQUA-2	Impact AQUA-115
			Impact AQUA-7	Impact AQUA-127
			Impact AQUA-19	Impact AQUA-128
			Impact AQUA-20	Impact AQUA-145
			Impact AQUA-37	Impact AQUA-146
			Impact AQUA-38	Impact AQUA-151
			Impact AQUA-43	Impact AQUA-163
			Impact AQUA-55	Impact AQUA-164
			Impact AQUA-56	Impact AQUA-169
			Impact AQUA-61	Impact AQUA-181
			Impact AQUA-73	Impact AQUA-182
			Impact AQUA-74	Impact AQUA-187
			Impact AQUA-79	Impact AQUA-199
			Impact AQUA-91	Impact AQUA-200
			Impact AQUA-92	Impact AQUA-205
			Impact AQUA-97	Impact REC-4
			Impact AQUA-109	
Develop and Implement a Barge Operations Plan	Ch. 11, Fish and Aquatic Resources Ch. 15, Recreation Ch. 19, Transportation Ch. 24, Hazards and Hazardous Material	1A-9	Impact AQUA-1	Impact AQUA-97
			Impact AQUA-2	Impact AQUA-109
			Impact AQUA-7	Impact AQUA-110
			Impact AQUA-19	Impact AQUA-145
			Impact AQUA-20	Impact AQUA-146
			Impact AQUA-37	Impact AQUA-151
			Impact AQUA-38	Impact AQUA-163
			Impact AQUA-43	Impact AQUA-164
			Impact AQUA-55	Impact AQUA-169
			Impact AQUA-56	Impact AQUA-181
			Impact AQUA-61	Impact AQUA-182
			Impact AQUA-73	Impact AQUA-187
			Impact AQUA-74	Impact AQUA-199
			Impact AQUA-79	Impact AQUA-200
			Impact AQUA-91	Impact AQUA-205
			Impact AQUA-92	Impact REC-4
			Impact AQUA-115	Impact REC-9
			Impact AQUA-127	Impact TRANS-15
			Impact AQUA-128	Impact HAZ-1



Environmental Commitments	Chapter/Resource	Alternative	Impact	
Construction Equipment Exhaust Reduction Plan	Ch. 17, Aesthetics and Visual Resources Ch. 22, Air Quality and Greenhouse Gases Ch. 28, Environmental Justice (Impact AES-1, Alt 9; Impact AQ-9)	1A-9 (except where noted)	Impact AES-1 Impact AQ-1 (1C, 2C, 6C only) Impact AQ-2 Impact AQ-3 Impact AQ-4 Impact AQ-9 Impact AQ-10 Impact AQ-11 Impact AQ-12 Impact AQ-13	Impact AQ-16 Impact AQ-17 (Alt 1A) Impact AQ-18 Impact AQ-20 Impact ECON-3 Impact ECON-5 Impact ECON-9 Impact ECON-11 Impact ECON-15
DWR Construction Best Management Practices to Reduce GHG Emissions <ul style="list-style-type: none"> <li>• Preconstruction and Final Design BMPs</li> <li>• Construction BMPs</li> </ul>	Ch. 20, Public Services and Utilities Ch. 22, Air Quality and Greenhouse Gases	1A-9	Impact UT-5 Impact AQ-16 Impact AQ-20 Impact ECON-15 Impact NOI-1 Impact NOI-2 Impact NOI-4	
Develop and Implement Noise Abatement Plan <ul style="list-style-type: none"> <li>• Construction and Maintenance Noise</li> <li>• Operation Noise</li> </ul>	Ch. 15 Recreation Ch. 16, Socioeconomics Ch. 23, Noise Ch. 28, Environmental Justice (Impact ECON-3; Impacts NOI-1, NOI-2, NOI-4)	1A-9	Impact REC-2 Impact REC-4 Impact REC-9 Impact REC-10 Impact ECON-3 Impact ECON-5	Impact ECON-9 Impact ECON-15 Impact NOI-1 Impact NOI-2 Impact NOI-4

Environmental Commitments	Chapter/Resource	Alternative	Impact	
Develop and Implement Hazardous Materials Management Plans	Ch. 11, Fish and Aquatic Resources	1A-9	Impact AQUA-1	Impact AQUA-128
			Impact AQUA-2	Impact AQUA-145
	Ch. 15, Recreation		Impact AQUA-7	Impact AQUA-146
	Ch. 16, Socioeconomics		Impact AQUA-19	Impact AQUA-151
	Ch. 20, Public Services and Utilities		Impact AQUA-20	Impact AQUA-163
	Ch. 24, Hazards and Hazardous Material		Impact AQUA-37	Impact AQUA-164
			Impact AQUA-38	Impact AQUA-169
	Ch. 28, Environmental Justice (Impact HAZ-2)		Impact AQUA-43	Impact AQUA-181
			Impact AQUA-44	Impact AQUA-182
			Impact AQUA-55	Impact AQUA-187
			Impact AQUA-56	Impact AQUA-199
			Impact AQUA-61	Impact AQUA-200
			Impact AQUA-62	Impact AQUA-205
			Impact AQUA-73	Impact REC-4
			Impact AQUA-74	Impact REC-9
			Impact AQUA-79	Impact ECON-3
			Impact AQUA-89	Impact ECON-15
			Impact AQUA-91	Impact UT-1
			Impact AQUA-92	Impact UT-8
			Impact AQUA-97	Impact HAZ-1
			Impact AQUA-109	Impact HAZ-2
			Impact AQUA-110	Impact HAZ-6
			Impact AQUA-115	Impact HAZ-7
			Impact AQUA-127	

Environmental Commitments	Chapter/Resource	Alternative	Impact
Develop and Implement Spill Prevention, Containment, and Countermeasure Plans	Ch. 8, Water Quality	1A-9	Impact WQ-31
	Ch. 11, Fish and Aquatic Resources		Impact AQUA-1
	Ch. 12, Terrestrial Biological Resources		Impact AQUA-2
	Ch. 15, Recreation		Impact AQUA-7
	Ch. 20, Public Services and Utilities		Impact AQUA-19
	Ch. 24, Hazards and Hazardous Material		Impact AQUA-20
	Ch. 28, Environmental Justice (Impact HAZ-2)		Impact AQUA-37
			Impact AQUA-38
			Impact AQUA-43
			Impact AQUA-44
			Impact AQUA-55
			Impact AQUA-56
			Impact AQUA-61
			Impact AQUA-62
			Impact AQUA-73
			Impact AQUA-74
			Impact AQUA-79
			Impact AQUA-89
			Impact AQUA-91
			Impact AQUA-92
			Impact AQUA-97
			Impact AQUA-109
			Impact AQUA-110
			Impact AQUA-115
			Impact AQUA-127
			Impact AQUA-128
			Impact AQUA-145
			Impact AQUA-146
			Impact AQUA-151
			Impact AQUA-163
Develop and Implement a Fire Prevention and Control Plan	Ch. 16, Socioeconomics	1A-9	Impact ECON-3
	Ch. 20, Public Services and Utilities		Impact ECON-15
	Ch. 24, Hazards and Hazardous Material		Impact UT-1
			Impact UT-8
			Impact HAZ-5
			Impact HAZ-7

Environmental Commitments	Chapter/Resource	Alternative	Impact	
Develop and Implement Mosquito Management Plans	Ch. 16, Socioeconomics Ch. 25, Public Health	1A-9	Impact ECON-3 Impact ECON-9 Impact ECON-15 Impact PH-1 Impact PH-5 Impact PH-10	
Conduct Environmental Training	Ch. 11, Fish and Aquatic Resources Ch. 15, Recreation Ch. 18, Cultural Resources Ch. 27, Paleontological Resources	1A-9	Impact AQUA-38 Impact AQUA-43 Impact AQUA-44 Impact AQUA-55 Impact AQUA-56 Impact AQUA-61 Impact AQUA-62 Impact AQUA-73 Impact AQUA-74 Impact AQUA-79 Impact AQUA-89 Impact AQUA-91 Impact AQUA-92 Impact AQUA-97 Impact AQUA-109 Impact AQUA-110 Impact AQUA-115 Impact AQUA-127 Impact AQUA-128	Impact AQUA-145 Impact AQUA-146 Impact AQUA-151 Impact AQUA-163 Impact AQUA-164 Impact AQUA-169 Impact AQUA-181 Impact AQUA-182 Impact AQUA-187 Impact AQUA-199 Impact AQUA-200 Impact AQUA-205 Impact REC-4 Impact REC-9 Impact CUL-3 Impact PALEO-1 Impact PALEO-2 Impact PALEO-3
Fugitive Dust Control	Ch. 17, Aesthetics and Visual Resources	1A-9 (except where noted)	Impact AES-1	Impact AQ-10
• Basic Fugitive Dust Control Measures	Ch. 22, Air Quality and Greenhouse Gases		Impact AQ-1 (1C, 2C, 6C only)	Impact AQ-11
• Enhanced Fugitive Dust Control Measures for Land Disturbance	Ch. 28, Environmental Justice (Impact AES-1, Alt 9; Impact AQ-9)		Impact AQ-2	Impact AQ-12
• Measures for Entrained Road Dust			Impact AQ-3	Impact AQ-13
• Measures for Concrete Batching			Impact AQ-4	Impact AQ-18
			Impact AQ-9	Impact AQ-20

Environmental Commitments	Chapter/Resource	Alternative	Impact	
Disposal and Reuse of Spoils, Reusable Tunnel Material (RTM), and Dredged Material <ul style="list-style-type: none"> <li>• Material Storage Site Determination</li> <li>• Material Storage Site Preparation</li> <li>• Draining, Chemical Characterization, and Treatment</li> <li>• Material Reuse Plans</li> <li>• Potential Environmental Effects</li> </ul>	Ch. 8, Water Quality	1A-9	Impact WQ-31	Impact AQUA-128
	Ch. 10, Soils		Impact SOILS-2	Impact AQUA-145
	Ch. 11, Fish and Aquatic Resources		Impact AQUA-1	Impact AQUA-146
	Ch. 12, Terrestrial Biological Resources		Impact AQUA-2	Impact AQUA-151
	Ch. 13, Land Use		Impact AQUA-6	Impact AQUA-163
	Ch. 14, Agricultural Resources		Impact AQUA-7	Impact AQUA-164
	Ch. 15, Recreation		Impact AQUA-19	Impact AQUA-169
	Ch. 16, Socioeconomics		Impact AQUA-20	Impact AQUA-181
	Ch. 20, Public Services and Utilities		Impact AQUA-24	Impact AQUA-182
	Ch. 24, Hazards and Hazardous Material		Impact AQUA-37	Impact AQUA-187
			Impact AQUA-38	Impact AQUA-199
			Impact AQUA-43	Impact AQUA-200
			Impact AQUA-44	Impact AQUA-205
			Impact AQUA-55	Impact BIO-5
			Impact AQUA-56	Impact BIO-8
			Impact AQUA-61	Impact BIO-176
			Impact AQUA-62	Impact LU-1
			Impact AQUA-73	Impact AG-1
			Impact AQUA-74	Impact REC-1
			Impact AQUA-79	(Alt 4)
			Impact AQUA-89	Impact REC-2
			Impact AQUA-91	Impact REC-4
			Impact AQUA-92	Impact REC-9
			Impact AQUA-97	Impact ECON-6
			Impact AQUA-109	Impact UT-5
			Impact AQUA-110	Impact HAZ-1
			Impact AQUA-115	Impact HAZ-6
			Impact AQUA-127	Impact HAZ-7
Provide Notification of Maintenance Activities in Waterways	Ch. 15, Recreation	1A-9	Impact REC-3	
	Ch. 16, Socioeconomics		Impact REC-7	
			Impact ECON-3	
			Impact ECON-5	
			Impact ECON-9	
			Impact ECON-11	
			Impact ECON-15	

Environmental Commitments	Chapter/Resource	Alternative	Impact	
Selenium Management	Ch. 8, Water Quality	1A-9	Impact WQ-26	Impact BIO-89
	Ch. 11, Fish and Aquatic Resources		Impact AQUA-116	Impact BIO-102
	Ch.12, Terrestrial Biological Resources		Impact BIO-56	Impact BIO-119
			Impact BIO-59	Impact BIO-120
			Impact BIO-61	Impact BIO-123
			Impact BIO-63	Impact BIO-129b
			Impact BIO-65	Impact BIO-133
			Impact BIO-67	Impact BIO-136
			Impact BIO-68	Impact BIO-147
			Impact BIO-71	Impact BIO-183
			Impact BIO-74	
CEQA and NEPA Compliance for BDCP-related Conservation Projects	All chapters	1A-2C, 3,4, 5, 6-9	N/A	
Comply with Caltrans' Division of Aeronautics on Location of Conveyance Facilities Within 2 Miles of Airport Boundary	Ch. 24, Hazards and Hazardous Material	1A-9	Impact HAZ-4	
Use of Slurry Cutoff Walls to Protect Groundwater during Dewatering Operations	Ch. 7, Groundwater	4, 4A, 2D, 5A	Impact GW-1	Impact GW-4
			Impact GW-2	Impact GW-5
			Impact GW-3	
Use of Slurry Cutoff Walls and Toe Drains to Minimize Seepage from Forebays	Ch. 7, Groundwater	4, 4A, 2D, 5A	Impact GW-1	Impact GW-4
			Impact GW-2	Impact GW-5

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## 2 3B.2.1 Geotechnical Studies

### 3 3B.2.1.1 Geotechnical Investigations

4 Subsurface investigations will be performed along the water conveyance alignment and at facility  
5 locations and material borrow areas. The main issues of concern in the Delta include stability of  
6 canal embankments and levees, liquefaction of Delta soils (particularly loose, saturated sands),  
7 seepage through coarse-grained soils, settlement of embankments and structures, subsidence, and  
8 soil bearing capacity. The investigations will explore a wide variety of soil types in the Delta that  
9 include peat, sands, silts and clays. The work to be performed will include a subsurface investigation  
10 program to provide information required to support the design and construction of the water  
11 conveyance facilities. Geotechnical investigations will be conducted to characterize existing soils and  
12 to select appropriate foundation types, lateral supports, and stabilization methods that shall be

implemented to ensure that the facilities are constructed to withstand design loads and to abide by applicable state and federal regulations. These investigations will build on information previously gathered in geotechnical data reports (California Department of Water Resources 2010a, 2010b, 2011, 2014) and conceptual engineering reports (California Department of Water Resources). Information to be gathered will consider common industry standards including the American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures, American Society of Testing of Materials, Division of Safety of Dams, California Department of Transportation, California Department of Water Resources, California Building Code, and U.S. Army Corps of Engineers (USACE) Design and Construction of Levees. The geotechnical investigation will also include a small-scale environmental screening to assess the presence or absence of dissolved gases to help guide tunnel ventilation and soil disposal considerations. This commitment is related to *AMM28 Geotechnical Studies*, described in Section 3B.4.28.

The spacing of soil boring and test locations likely will average about 1,000 feet along proposed canal and tunnel alignments and approximately 100 to 200 feet at intakes, pumping plants, forebays, siphons, and other hydraulic structures.

Site-specific geotechnical studies are expected to include the following, as appropriate.

- Observing, recording, collecting, and testing subsurface materials obtained during site-specific geotechnical exploration.
- Standard penetration tests (drilling and sampling), cone penetration tests, geophysical tests, and other in-situ soil tests, slug tests, aquifer/pumping tests, and trench test pits to observe, record, and evaluate subsurface conditions.
- Installing wells and monitoring groundwater elevations and soil permeability for use in assessing liquefaction and dewatering characteristics.
- Performing geotechnical laboratory testing on select samples to evaluate engineering and other properties of collected soils.
- Preparing geotechnical data reports to document observations and findings of subsurface investigations and tests.
- Preparing geotechnical baseline and/or other reports to describe expected construction conditions and provide design and construction recommendations.

As described in Chapter 3, Section 3.6.1.10, DWR has developed a Draft Geotechnical Exploration Plan (Phase 2) for the Alternative 4 conveyance alignment (MPTO). The geotechnical investigation plan provides additional details regarding the rationale, investigation methods and locations, and criteria for obtaining subsurface soil information and laboratory test data (California Department of Water Resources 2014). The proposed exploration is designed as a two-part program (Phases 2a and 2b) to collect geotechnical data. The two-part program will allow refinement of the second part of the program to respond to findings from the first part. The proposed subsurface exploration will focus on geotechnical considerations of the following aspects of water conveyance facility development: engineering considerations, construction-related considerations, permitting and regulatory requirements, and seismic characterization considerations.

Data obtained from the geotechnical investigations will be used to support the development of a geological model for the selected alternative, characterize ground conditions within the water conveyance alignments and as necessary for the implementation of habitat restoration and

enhancement actions, and aid in the avoidance of geologic risks associated with the construction of the water conveyance facilities. Data from these investigations, which would occur at several sites within the water conveyance construction footprint of the selected alternative, would help identify and/or inform the following.

- The types of soil avoidance or soil stabilization measures that should be implemented to ensure that the proposed facilities are constructed to withstand subsidence and settlement, soil corrosivity, and to conform to applicable state and federal standards.
- The extent and type of ground improvement that may be required to facilitate support of tunnel shafts, control groundwater at the locations of the shafts, prevent development of undesired tunnel-induced surface settlements and provide pre-defined zones for tunnel boring machine (TBM) maintenance interventions.
- The potential risk of settlement and subsequent collapse of excavations
- Additional design provisions and mitigation needed due to the potential presence of dissolved gas along the water conveyance alignments

***Explanation of effectiveness:*** Based on these findings, engineering solutions to any potentially hazardous conditions, such as ground failure, expansive, corrosive and compressible soils, and dissolved gas within soils, will be incorporated in the final designs of the proposed facilities, consistent with the codes and standard requirements of federal, state and local oversight agencies. Accordingly, otherwise potentially adverse effects/significant impacts (i.e., those related to the potential loss of property, personal injury or death) related to these hazardous conditions will be reduced and/or avoided based on adherence to these standards.

### **3B.2.1.2 Settlement Monitoring and Response Program**

Localized settlement can occur during tunneling and other construction activities such as dewatering and hauling materials. Settlement above tunnels is usually in response to ground loss at the tunnel face, voids created around the tunnel during mining, and/or stress redistribution around the excavated tunnel. The magnitude of risk for ground settlement depends on the excavated diameter of the tunnel, the amount of ground cover above the tunnel, excavation methods, workmanship, details of tunnel construction, and the geotechnical properties of the ground. Settlement risk is mitigated through selection of equipment and means and methods of construction.

Based on the preliminary data regarding Delta ground conditions, it is assumed that an earth pressure balancing TBM will likely be used for tunneling. These machines rely on the excavated soil, under confinement of a cutterhead chamber, to balance earth and hydrostatic pressures. The pressure is maintained by a screw conveyor in which a soil plug provides the seal and excavated soil is removed through the screw onto the conveyor.

Should geotechnical reports indicate high settlement risk in certain areas, pre-excavation ground stabilization treatment will be performed ahead of the TBM. Utilization of an Earth Pressure Balanced TBM and implementation of a well planned and executed ground stabilization program will mitigate potential for ground settlement due to tunnel construction. Ground stabilization methods and settlement monitoring programs will be evaluated during design, with requirements for ground stabilization and settlement monitoring specified during construction. Construction contracts will include prescriptive specification requirements for settlement monitoring at sensitive features, such as levees—to ensure that tunneling, dewatering, and traffic-induced settlement



remains within specified limits. These requirements shall be consistent with common industry standards such as those found in Chapter 9, *Geology and Seismicity*, Section 9.2, *Regulatory Setting*.

***Explanation of effectiveness:*** This environmental commitment, which includes geotechnical investigations and settlement monitoring and response programs, will assist in BMPs, including this environmental commitment, would be implemented to minimize dewatering impacts to the extent practicable. To prevent structural failure, design-level geotechnical studies would be prepared by a geotechnical engineer licensed in the state of California during project design. The studies would further assess site-specific conditions at and near all the project facility locations, including seismic activity, soil liquefaction, and other potential geologic and soil-related hazards. The studies would provide the basis for designing the conveyance features to withstand the peak ground acceleration caused by fault movement in the region. The geotechnical report will contain site-specific evaluations of the seismic hazard affecting the project, and will identify portions of the project site containing seismic hazards. The report will also identify any known off-site seismic hazards that could adversely affect the site in the event of an earthquake and make recommendations for appropriate mitigation as required by 14 CCR 3724(a). The California-registered civil engineer or California-certified engineering geologist's recommended measures to address this hazard would conform to applicable design.

In the absence of compliance with these geotechnical studies, the risks associated with structural failure, and personal injury, death or loss of property as a result of construction activities would be higher, which could result in a significant impact. However, it is unlikely that implementation of this environmental commitment alone would ensure less-than-significant geology- and seismicity-related impacts. Other environmental commitments, such as such design codes, guidelines, and standards, such as the California Building Code and resource agency and professional engineering specifications, and the Division of Safety of Dams Guidelines for Use of the Consequence Hazard Matrix and Selection of Ground Motion Parameters, DWR's Division of Flood Management *FloodSAFE Urban Levee Design Criteria*, and USACE's *Engineering and Design—Earthquake Design and Evaluation for Civil Works Projects* would also be implemented to help reduce the severity of these impacts to a less-than-significant level. Conformance to these and other applicable design specifications and standards would ensure that the impacts related to risk such as ground movement and structural failure would not jeopardize the integrity of the levees, conveyance facilities, and other features constructed for this project.

## 3B.2.2 Conform with Applicable Design Standards and Building Codes

The project proponents will ensure that the standards, guidelines, and codes listed below (or the most current applicable version at the time of implementation), which establish minimum design criteria and construction requirements for tunnels, canals, levees, pipelines, excavations and shoring, pumping stations, grading, and foundations, bridges, access roads, structures, and other facilities, will be followed by the project engineers, where applicable, in the design of project facilities and will be included as minimum standards in the construction specifications. This commitment is related to *AMM29 Design Standards and Building Codes*, described in Section 3B.4.29. Additionally, during construction, the California Occupational Safety and Health Act of 1973, as administered by California Occupational Safety and Health Administration (Cal/OSHA), will be followed as a minimum standard to protect workers. The project proponents will ensure that the identified design standards are treated as the minimum standard for design and construction, unless

more stringent requirements are enacted or promulgated. The minimum design and construction requirements act as performance standards for engineers and construction contractors. Because the design and construction parameters of these codes and standards are intended to reduce the potential for structural damage or risks to human health due to the geologic and seismic conditions that exist within the Plan Area and the surrounding region, their use is considered an environmental commitment of the agencies implementing the BDCP or proposed project.

The project engineers will follow standards, guidelines, and code requirements that are legally mandated. Proposed design standards include, but may not be limited to, the following:

- American Association of State Highway and Transportation Officials Guide Specifications for LRFD (load and resistance factor) Seismic Bridge Design, 1st Edition, 2009.
- American Railway Engineering and Maintenance-of-Way Association Manual for Railway Engineering, Volume 2, Chapter 9, *Seismic Design for Railway Structures*, 2008.
- American Society of Civil Engineers *Minimum Design Loads for Buildings and Other Structures*, ASCE-7-10, 20.10
- California Building Code, 2010 (California Code of Regulations [CCR], Title 24).
- California Department of Transportation (Caltrans) Seismic Design Criteria, Version 1.6, Nov 2010.
- CCR, Title 8.
- DWR Division of Safety of Dams *Guidelines for Use of the Consequence-Hazard Matrix and Selection of Ground Motion Parameters*, 2002.
- DWR Division of Flood Management *FloodSAFE Urban Levee Design Criteria*, May 2012.
- DWR Division of Engineering *State Water Project – Seismic Loading Criteria Report*, September 2012.
- DWR *Delta Seismic Design*, June 2012.
- Federal Highway Administration *Seismic Retrofitting Manual for Highway Structures*, Parts 1 and 2, 2006.
- State of California Sea-Level Rise Task Force of the Coastal and Ocean Working Group of the California Climate Action Team (CO-CAT), *Sea-Level Rise Interim Guidance Document*, 2010.
- USACE (CESPK-ED-G), *Geotechnical Levee Practice*, SOP EDG-03, 2004.
- USACE *Design and Construction of Levees*, EM 1110-2-1913, 2000.
- USACE *Engineering and Design—Earthquake Design and Evaluation for Civil Works Projects*, ER 1110-2-1806, 1995.
- USACE *Engineering and Design—Earthquake Design and Evaluation of Concrete Hydraulic Structures*, EM 1110-2-6053, 2007.
- USACE *Engineering and Design—General Design and Construction Considerations for Earth and Rock-Fill Dams*, EM 1110-2-2300, 2004.
- USACE *Engineering and Design—Response Spectra and Seismic Analysis for Concrete Hydraulic Structures*, EM 1110-2-6050, 1999.

- USACE *Engineering and Design—Stability Analysis of Concrete Structures*, EM 1110-2-2100, 2005.
- USACE *Engineering and Design—Structural Design and Evaluation of Outlet Works*, EM 1110-2-2400, 2003.
- USACE *Engineering and Design—Time-History Dynamic Analysis of Concrete Hydraulic Structures*, EM 1110-2-6051, 2003.
- USACE *Slope Stability*, EM 1110-2-1902, 2003.
- USACE *Engineering and Design—Settlement Analysis*, EM 1110-1-1904, 1990.
- USACE *Engineering and Design—Design of Pile Foundations*, EM 1110-2-2906, 1991.
- U.S. Department of the Interior and U.S. Geological Survey *Climate Change and Water Resources Management: A Federal Perspective*, Circular 1331.

**Explanation of effectiveness:** These building codes and design standards represent performance standards that are recommended or must be met by engineers and construction contractors, and are often subject to monitoring by state and local agencies. Conformance with these federal and state design standards, guidelines and building codes, as well as with the health and safety requirements of CCR Title 8, would avoid a significant impact involving potential risk of personal injury, death, structural damage, or loss of property due to the following.

- Structural failure from strong seismic shaking during construction or operation of water conveyance features.
- Settlement or collapse of excavations due to dewatering.
- Ground settlement.
- Seepage under forebay embankments.
- Structural failure due to construction-related ground motions.
- Rupture of a known earthquake fault during operation of water conveyance features.
- Seismic-related ground failure during operations of water conveyance features.
- Landslides and other slope instability during operation of water conveyance features.
- Structural failure due to rupture of a known earthquake fault at project restoration opportunity areas (ROAs).
- Seismically induced seiche or tsunami during operation of water conveyance features.

In the absence of compliance with these building codes, design standards, and health and safety requirements, the risks associated with personal injury, death or loss of property as a result of construction activities would be higher, which could result in a significant impact.

### 3B.2.3 Electrical Power Guidelines

This commitment is related to *AMM30 Transmission Line Design and Alignment Guidelines*, described in Section 3B.4.30. The project proponents will procure design and construction of the proposed new transmission lines and appurtenances such as supports (poles and towers) and substations through electrical utility providers. The project proponents will specify that design and construction

of power facilities be in accordance with electric and magnetic field (EMF) guidance adopted by the California Public Utilities Commission, *EMF Design Guidelines for Electrical Facilities* (2006) or any comparable federal guidelines. The guidelines describe the routine magnetic field reduction measures that all regulated California electric utilities are to consider for new and upgraded transmission line and transmission substation construction. The guidelines include the following magnetic field reduction methods for new and upgraded electrical facilities.

- Increasing the distance from electrical facilities by:
  - Increasing structure height or trench depth.
  - Locating power lines closer to the centerline of the utility corridor.
- Reducing conductor (phase) spacing.
- Phasing circuits to reduce magnetic fields.

***Explanation of effectiveness:*** Current scientific evidence does not show conclusively that EMF exposure can increase health risks, and state and federal public health regulatory agencies have determined that setting numeric exposure limits is not appropriate. However, in light of the scientific uncertainty and public concern about potential public health impacts from EMF exposure, the California Public Utilities Commission developed the EMF design guidelines, which are intended for new construction or major reconstruction of electric utility transmission, substation, and distribution facilities. Based on this, utility companies are required to consider the “low-cost, no-cost” EMF design guidelines in order to reduce potential health risks associated with power lines (California Public Utilities Commission 2006).

### 3B.2.4 Electrical Power Line Support Placement

This commitment is related to *AMM30 Transmission Line Design and Alignment Guidelines*, described in Section 3B.4.30. The Project proponents will contract with electric utilities to provide primary power to designated locations for temporary and/or permanent power. The Project proponents will request electric utilities to design and construct power transmission lines and the locations of necessary appurtenances such as supports and substations to avoid sensitive terrestrial and aquatic habitats to the maximum extent feasible. In cases where sensitive habitat cannot be feasibly avoided, disturbance will be minimized to the greatest degree feasible. The Project proponents will request electric utilities to design and construct power transmission lines and the locations of necessary appurtenances to minimize take and encumbrance of agricultural lands. The Project proponents will be responsible for ensuring that disturbed areas are returned to preconstruction conditions, to the extent feasible, and property owners compensated for real property losses. This should be accomplished through an agreement with the utility provider. This should be accomplished through an agreement with the utility provider.

The Project proponents will request electric utilities to design tower and pole placement and location of substations to avoid existing structures and improvements to the extent feasible. In cases where existing structures and improvements cannot be feasibly avoided, the Project proponents will ensure that structures and improvements are relocated or the owner compensated for the loss and ensure that disturbed areas are returned to preconstruction conditions. Where poles or towers are to be constructed in agricultural areas, the Project proponents will request incorporation of the following BMPs where feasible.

- Select means and methods of construction to minimize crop damage.

- Use single-pole structures instead of H-frame or other multiple-pole structures to reduce the potential for interference with farm machinery, reduce land impacts, and minimize weed encroachment issues.
- Locate lines adjacent to roads and existing property lines to reduce property take and encumbrance.
- Use transmission structures with longer spans to clear longer sections of fields or sensitive areas except in aerial spraying and seeding areas. In areas where aerial spraying and seeding are common, install markers on the shield wires above the conductors.
- Minimize the use of guy wires, and keep guy wires out of crop and hay lands. Place highly visible shield guards on guy wires in farm vehicle and equipment traffic areas.
- Locate new transmission lines along existing transmission line corridors.

**Explanation of effectiveness:** This environmental commitment will request electric utilities to design and construct power transmission lines and other components so as to avoid sensitive terrestrial and aquatic habitat to the maximum extent feasible. In cases where sensitive habitat cannot be feasibly avoided, disturbance will be minimized to the greatest degree feasible. Habitat loss would be reduced as a result of this commitment, but may not be fully avoided. In the absence of this environmental commitment, there would be a greater potential for significant impacts on species habitat due to construction and placement of power line facilities. Refer to impact analyses in Chapter 11, *Fish and Aquatic Resources*, and Chapter 12, *Terrestrial Biological Resources*, for more detail.

### 3B.2.5 Develop and Implement Stormwater Pollution Prevention Plans

The Project proponents will be responsible for ensuring coverage under the Construction General Permit for Construction and Land Disturbance Activities (Construction General Permit [CGP]) (Order 2010-0014-DWQ or any more recent version) issued from the State Water Resources Control Board (State Water Board). The CGP requires the development and implementation of a stormwater pollution prevention plan (SWPPP). This commitment is related to *AMM3 Stormwater Pollution Prevention Plan*, described in Section 3B.4.3. For the alternative selected, a series of separate but related SWPPPs will be prepared by a Qualified SWPPP Developer (QSD) and will be implemented under the supervision of a Qualified SWPPP Practitioner (QSP). As part of the procedure to gain coverage under the CGP, the QSD will determine the “Risk Level” (Levels 1, 2, or 3, or Types 1, 2, or 3 for linear underground/overhead projects) of the construction activities covered by a given SWPPP, which involves an evaluation of the site’s “Sediment Risk” and “Receiving Water Risk.” The risk is calculated separately for sediment and receiving water, with two risk categories for receiving water (low and high) and three risk categories for sediment risk (low, medium, and high). The overall project risk levels (1, 2, or 3) are then determined through a matrix, where Risk Level 1 applies to projects with low receiving water and sediment risks, Risk Level 3 for projects with high receiving water and sediment risks, and Risk Level 2 for all other combinations of sediment and receiving water risks. These project risk levels determine the level of protection (i.e., the BMPs to be used) and monitoring that is required for the project.

Table 3B-2 shows how varying sediment risk and receiving water risk combine to result in a given Risk Level for a given construction site.

**Table 3B-2. Combined Risk Level Matrix**

		Sediment Risk		
		Low	Medium	High
Receiving Water Risk	Low	Level 1		Level 2
	High		Level 2	Level 3

The objectives of the SWPPPs will be to (1) identify pollutant sources associated with construction activities and operations that may affect the quality of stormwater and (2) identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. The SWPPP will be kept onsite during construction activity and operations and will be made available upon request to representatives of the San Francisco Bay and Central Valley Regional Water Quality Control Boards.

In accordance with the CGP, the SWPPP will describe site topographic, soil, and hydrologic characteristics; construction activities and schedule; construction materials to be used, including sources of imported fill material, and other potential sources of pollutants at the construction site; potential non-stormwater discharges (e.g., trench dewatering); erosion and sediment control measures; "housekeeping" BMPs to be implemented; a BMP implementation schedule; a site and BMP inspection schedule; and ongoing personnel training requirements. These provisions are intended to prevent water quality degradation related to pollutant discharge to receiving waters and to prevent or constrain changes to the pH of receiving waters. Performance standards specified in the CGP will be met by implementing stormwater pollution prevention BMPs that are tailored to specific site conditions, including the Risk Level of individual construction sites. These environmental commitments mirror the requirements to gain and maintain coverage under the CGP. The Project proponents will ensure consultation with the appropriate Regional Water Quality Control Board (RWQCB) or State Water Board to determine the appropriate aggregation of specific construction activities, or groups of activities, to be authorized under the CGP.

It is anticipated that multiple SWPPPs will be prepared for project-related construction activities, with a given SWPPP prepared to cover a particular water conveyance component (e.g., intermediate forebay), groups of components (e.g., intakes), or construction activities associated with conservation components. The risk level will be identified for each action covered by a specific SWPPP.

The following list of BMPs are requirements common to all Risk Level sites; however, some detail is provided in "Inspection and Monitoring" on various Risk Level requirements.

- Erosion Control Measures.
  - Implement effective wind erosion BMPs, such as watering, application of soil binders/tackifiers, and covering stockpiles.
  - Provide effective soil cover for inactive areas and all finished slopes and utility backfill areas, such as seeding with a native seed mix, application of hydraulic mulch and bonded fiber matrices, and installation of erosion control blankets and rock slope protection.
- Sediment Control Measures.
  - Prevent transport of sediment at the construction site perimeter, toe of erodible slopes, soil stockpiles, and into storm drains.

- Capture sediment via sedimentation and stormwater detention facilities.
- Reduce runoff velocity on exposed slopes.
- Reduce off-site sediment tracking.
- Management Measures for Construction Materials.
  - Cover and berm inactive stockpiled construction materials.
  - Store chemicals in watertight containers.
  - Minimize exposure of construction materials to stormwater.
  - Designate refueling and equipment inspection/maintenance locations.
  - Control of drift and runoff from areas treated with herbicides, pesticides, and other chemicals that may be harmful to aquatic habitats.
- Waste Management Measures.
  - Prevent off-site disposal or runoff of any rinse or wash waters.
  - Implement concrete and truck washout facilities and appropriately sized storage, treatment, and disposal practices.
  - Ensure the containment of sanitation facilities (e.g., portable toilets).
  - Clean or replace sanitation facilities (as necessary) and inspect regularly for leaks/spills.
  - Cover waste disposal containers during rain events and at end of every day.
  - Protect stockpiled waste material from wind and rain.
- Construction Site Dewatering and Pipeline Testing Measures.
  - Reclaim site dewatering discharges to the extent practicable, or use for other construction purposes (e.g., land application for dust control).
  - Implement appropriate treatment and disposal of construction site dewatering from excavations to prevent discharges to surface waters, unless permitted by regulatory agencies to discharge to surface waters.
  - Dechlorinate pipeline test waters before discharging to surface waters.
- Accidental Spill Prevention and Response Measures.
  - Provide equipment and materials necessary for cleanup of accidental spills onsite.
  - Clean up accidental spills and leaks immediately and dispose of properly.
  - Ensure that there are trained spill response personnel available.
- Non-Stormwater Management Measures.
  - Control all non-stormwater discharges during construction.
  - Wash vehicles in such a manner as to prevent non-stormwater discharges to surface waters.
  - Clean streets in such a manner as to prevent non-stormwater discharges from reaching surface water.

- Discontinue the application of any erodible landscape material during rain, or within 2 days before a forecasted rain event.
- Inspection and Monitoring Common to all Risk Levels.
  - Ensure that all inspection, maintenance, repair, and sampling activities at the construction site will be performed or supervised by a QSP representing the discharger.
  - Develop and implement a written site-specific Construction Site Monitoring Program (CSMP).
- Inspection, Monitoring, and Maintenance Activities Based on the Risk Level of the Construction Site (as defined in the State Water Board CGP).
  - Risk Level 1 Sites:
    - Perform weekly inspections of BMPs, and at least once each 24-hour period during extended storm events.
    - At least 2 business days (48 hours) prior to each anticipated qualifying rain event (a rain event producing 0.5 inch or more of precipitation), visually inspect: (a) stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources; (b) all BMPs to identify whether they have been properly implemented in accordance with the SWPPP; and (c) stormwater storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
    - Visually observe stormwater discharges at all discharge locations within two business days (48 hours) after each qualifying rain event and identify additional BMPs as necessary, and revise the SWPPP accordingly.
    - Conduct minimum quarterly visual inspections of each drainage area for the presence of (or indications of prior) unauthorized and authorized non-stormwater discharges and their sources.
    - Collect one or more samples of construction site effluent during any breach, malfunction, leakage, or spill observed within the construction site during a visual inspection which could result in the discharge of pollutants to surface waters that will not be visually detectable in stormwater.
  - Risk Level 2 Sites:
    - Risk Level 2 dischargers will perform all of the same visual inspection, monitoring, and maintenance measure specified for Risk Level 1 dischargers.
    - At a minimum, Risk Level 2 dischargers will collect and analyze a minimum of three samples per day for pH and turbidity during qualifying rain events. The CGP also requires the discharger to revise the SWPPP and to immediately modify existing BMPs and/or implement new BMPs such that subsequent discharges are below the relevant Numeric Action Levels (NALs) specified by the CGP. It may be a violation of the CGP if the discharger fails to take corrective action to reduce the discharge below these NALs.
    - Dischargers who deploy Active Treatment Systems (ATS) on their site, or a portion on their site, will collect ATS effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.



- In the event that any effluent sample exceeds an applicable NAL, Risk Level 2 dischargers shall submit all storm event sampling results to the State Water Board no later than 10 days after the conclusion of the storm event. The Regional Boards have the authority to require the submittal of an NAL Exceedance Report, which includes a description of the current BMPs associated with the effluent sample that exceeded the NAL and the proposed corrective actions taken.

- Risk Level 3 Sites:

- Risk Level 3 dischargers will perform all of the same visual inspection, monitoring, and maintenance measure specified for Risk Level 1 and Risk Level 2 dischargers.
- In the event that a Risk Level 3 discharger exceeds a numeric effluent limitation (NEL) of the CGP (i.e., pH and turbidity), and has a direct discharge into receiving waters, the discharger will subsequently sample receiving waters for all parameter(s) monitored in the discharge. An exceedance of an NEL is considered a violation of the CGP, and the discharger must electronically submit all storm event sampling results to the State and Regional Water Boards via Stormwater Multiple Application and Report Tracking System (SMARTS) no later than 5 days after the conclusion of the storm event.<sup>11</sup>
- If disturbing 30 acres or more of the landscape and discharging directly into receiving waters, conduct a benthic macroinvertebrate bioassessment of receiving waters prior to and after commencement of construction activities to determine if significant degradation to the receiving water's biota has occurred. However, if commencement of construction is outside of an index period (i.e., the period of time during which bioassessment samples must be collected to produce results suitable for assessing the biological integrity of streams and rivers) for the site location, the discharger will participate in the State of California's Surface Water Ambient Monitoring Program.

The SWPPP will also specify the forms and records that must be uploaded to the State Water Board online SMARTS, such as quarterly non-stormwater inspection and annual compliance reports.

If the QSP determines the site is Risk Level 2 or 3, water sampling for pH and turbidity will be required and the SWPPP will specify sampling locations and schedule, sample collection and analysis procedures, and recordkeeping and reporting protocols. In accordance with the CGP numeric action level requirements, the project contractor's QSD will revise the SWPPP and modify existing BMPs or implement new BMPs when effluent monitoring indicates that daily average runoff pH is outside the range of 6.5 to 8.5 and that the daily average turbidity is greater than 250 nephelometric turbidity units (NTUs). Such BMPs may include construction of sediment traps and sediment basins, use of 'Baker' or other type tanks, installation of rock slope protection, covering of active stockpiles in event of rain, constructing desilting basins, and use of ATS. The ability of other areas to withstand excessive erosion and sedimentation may be increased by applying additional mulching, bonded fiber matrices, and erosion control blankets; reseeding with a native seed mix; and installation of additional fiber rolls, silt fences, and gravel bag berms. The QSD may also specify changes in the manner and frequency of BMP inspection and maintenance activities. The

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<sup>11</sup> The State Water Board has suspended the applicability of Numeric Effluent Limitations (NELs) for pH and turbidity at Risk Level 3/LUP Type 3 construction sites. In addition, because receiving water monitoring is required only if the NELs are triggered, all receiving water monitoring requirements are also suspended. The Level 3/Type 3 NEL requirements are presented here assuming that such NELs will be reinstated when project construction commences.

determination of which BMP should be applied in a given situation is very site-specific. QSDs typically refer to the California Stormwater Quality Association's *Stormwater Best Management Practice Handbook Portal: Construction* or the similar Caltrans manual for selecting BMPs for particular site conditions.

Additionally, if a given construction component is Risk Level 3, for that component Project proponents will report to the State Water Board when effluent monitoring indicates that daily average runoff pH is outside the range of 6.0 to 9.0 or the daily average turbidity is greater than 500 NTUs. In the event that the turbidity NEL is exceeded, the Project proponents may also be required to sample and report to the State Water Board pH, turbidity, and suspended sediment concentration of receiving waters for the duration of construction.

The contractor will also conduct sampling of runoff effluent when a leak, spill, or other discharge of nonvisible pollutants is detected.

The CGP has specific monitoring and action level requirements for the Risk Levels, which are summarized in Table 3B-3.

**Table 3B-3. SWPPP Monitoring and Action Requirements**

SWPPP Requirements	Risk Level/Type		
	1	2	3
Minimum Stormwater and Non-Stormwater BMPs	✓	✓	✓
Numeric Action Levels (NAL)		✓	✓
NAL for pH: 6.5–8.5 pH units			
NAL for turbidity: 250 NTU			
Numeric Effluent Limitations (NEL)			✓
NEL for pH: 6–9 pH units			
NEL for turbidity: 500 NTU			
Visual Monitoring (weekly; before, during, after rain events; non-stormwater)	✓	✓	✓
Runoff Monitoring		✓	✓
Receiving Water Monitoring			✓
Note: The State Water Board has suspended the applicability of NELs for pH and turbidity at Risk Level 3/LUP Type 3 construction sites. In addition, because receiving water monitoring is required only if the NELs are triggered, all receiving water monitoring requirements are also suspended. The Level 3/Type 3 NEL requirements are presented here assuming that such NELs will be reinstated when project construction commences.			
BMP = best management practices.			
pH = potential hydrogen.			
NTU = nephelometric turbidity unit.			

The QSD preparing a SWPPP may include in the SWPPP BMPs such as preservation of existing vegetation, perimeter control, seeding, mulching, fiber roll and silt fence barriers, erosion control blankets, protection of stockpiles, watering to control dust entrainment, rock slope protection, tracking control, equipment refueling and maintenance, concrete and solid waste management, and other measures to ensure compliance with the pH and turbidity level requirements defined by the CGP. Partly because the potential adverse effect on receiving waters depends on location of a work area relative to a waterway, the BMPs will be site-specific. For example, BMPs applied to level island-interior sites will be different than BMPs applied to water-side levee conditions. The QSP will

be responsible for day-to-day implementation of the SWPPP, including BMP inspections, maintenance, water quality sampling, and reporting, to the State Water Board. If the water quality sampling results indicate an exceedance of NALs and Numeric Effluent Limitations (NELs) for pH and turbidity, as described above, the QSD will modify the type and/or location of the BMPs by amending the SWPPP in order to reduce pH, turbidity, and other contaminants to acceptable levels, consistent with CGP NALs and NELs and with the water quality objectives and beneficial uses set forth in the Basin Plan.

**Explanation of effectiveness:** Construction, operation, and maintenance of the water conveyance facilities, as well as activities involving construction or ground disturbance associated with implementing other conservation measures, may result in increased erosion, sedimentation, and the addition of pollutants to stormwater discharges. Depending on the severity of these effects, significant impacts on surface and groundwater water quality, soils, fish, aquatic communities, recreational fishing, public safety, and public services (wastewater treatment facilities) in the Plan Area could result. Implementing site-specific SWPPPs would ensure the design, implementation, management and maintenance of SWPPP BMPs minimize the amount of sediment and other pollutants in stormwater discharges, and thereby avoid or reduce the severity of this impact. However, it is unlikely that implementation of SWPPP BMPs alone would ensure less-than-significant construction-related water quality impacts. Other environmental commitments (e.g., spill prevention, containment, and countermeasure plans, and hazardous materials management plans), would also be implemented to help reduce the severity of these impacts to a less-than-significant level. Additionally, for some impacts where SWPPP BMPs would be relied upon, mitigation measures would still be necessary to reduce a significant impact to less than significant (e.g., Impact HAZ-1, Impact HAZ-6, and Impact REC-4).

### 3B.2.6 Develop and Implement Erosion and Sediment Control Plans

The Project proponents commit to implementing measures as described below as part of the construction activities. In accordance with these environmental commitments, the Project proponents will ensure the preparation and implementation of erosion and sediment control plans to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas damaged by construction activities. This commitment is related to *AMM4 Erosion and Sediment Control Plan*, described in Section 3B.4.4. It is anticipated that multiple erosion and sediment control plans will be prepared for project-related construction activities, each taking into account site-specific conditions such as proximity to surface water, erosion potential, drainage, etc. The plans will include all the necessary CGP requirements regarding erosion control and will specify BMPs for erosion and sediment control that are to be implemented during construction activities. These BMPs will be incorporated into the SWPPPs (see Section 3B.2.5, *Develop and Implement Stormwater Pollution Prevention Plans*).

Erosion control measures will include the following.

- Install physical erosion control stabilization features (hydroseeding with native seed mix, mulch, silt fencing, fiber rolls, sand bags, and erosion control blankets) to capture sediment and control both wind and water erosion. Erosion control may not utilize plastic monofilament netting or similar materials.

- 1 • Keep emergency erosion-control supplies onsite at all times during construction, and have the  
2 contractor(s) use these emergency stockpiles as needed. The Project proponents and/or the  
3 contractors will ensure that supplies used from the emergency stockpiles are replaced within 48  
4 hours. Project proponents will also ensure that materials used in construction of erosion control  
5 methods will be removed from the work site and properly disposed when no longer needed.
- 6 • Design grading to be compatible with adjacent areas and minimize potential for disturbance of  
7 adjacent terrain and natural land features and minimize erosion in disturbed areas to the extent  
8 feasible.
- 9 • Divert runoff away from steep, denuded slopes, or other critical areas with barriers, berms,  
10 ditches, or other facilities.
- 11 • To the extent feasible, retain native trees and vegetation to help stabilize hillsides, retain  
12 moisture, and reduce erosion.
- 13 • Sequence clearing of native vegetation, and disturbance of soils to minimize overall time of soil  
14 disturbance.
- 15 • Sequence construction activities to mitigate erosion from rainfall events, runoff, or flooding, to  
16 the extent feasible.
- 17 • Conduct site inspections (before, during, and after significant storm events) to ensure that  
18 control measures are intact and working properly and to correct problems as needed.
- 19 • Install runoff and drainage control features (e.g., berms and swales, slope drains) as necessary  
20 to avoid and minimize erosion.

21 Sediment control measures will include:

- 22 • Use detention ponds, silt traps, wattles, berms, barriers or similar measures to slow water  
23 velocity and retain sediment transported by onsite run on or runoff.
- 24 • Collect and direct surface run on and runoff at non-erosive velocities to controlled drainage  
25 courses.
- 26 • When ground disturbing activities are required adjacent surface water, wetlands, or aquatic  
27 habitat, the use of sediment and turbidity barriers, soil stabilization and revegetation of  
28 disturbed surfaces.
- 29 • Prevent mud from being tracked onto public roadways by installing gravel on primary  
30 construction ingress/egress points, rumble plates, and/or truck tire washing.
- 31 • Deposit or store excavated materials away from drainage courses and cover if left in place for  
32 more than 5 days or storm events are forecast within 48 hours.

33 After construction is complete, site-specific restoration efforts will include grading, post  
34 construction BMPs for erosion control, and revegetation. Revegetation will emphasize self-  
35 sustaining, local native plants, unless the owner of the property or an agency having jurisdiction  
36 requires a different but equally or more effective approach to restoring disturbed areas. All  
37 disturbed areas will be graded, with disturbed areas revegetated by seeding or other means. Once  
38 post construction BMPs are constructed and revegetation is appropriately established a Notice of  
39 Termination will be filed with the State Water Board.

**Explanation of effectiveness:** As previously described in Section 3B.2.5, *Develop and Implement Stormwater Pollution Prevention Plans*, construction, operation, and maintenance of the water conveyance facilities, as well as activities involving construction or ground disturbance associated with implementing other conservation measures, may result in increased erosion and sedimentation. Implementing site-specific erosion and sediment control plans as part of the SWPPPs would minimize or avoid erosion and sedimentation, which may otherwise have significant impacts on the resources identified in Table 3B-1 due to implementation of the project. For some potentially significant impacts (e.g., Impact SOILS-6), the implementation of the erosion control BMPs would ensure that the impact was less than significant because the measures described above would avoid accelerated erosion caused by land disturbance associated with implementation of the project. However, for other impacts (e.g., Impacts REC-4 and REC-9), erosion and sediment control BMPs would not be sufficient to reduce significant impact to a less-than-significant level and mitigation measures would be required.

### 3B.2.7 Develop and Implement Fish Rescue and Salvage Plans

Fish rescue operations will occur at any in-water construction site where dewatering and resulting isolation of fish may occur (e.g., when dewatering creates isolated pools within the stream channel). Fish Rescue and Salvage Plans will be developed by the DWR in coordination with fish agencies and will include detailed procedures for fish rescue and salvage to minimize the number of Chinook salmon, steelhead, green sturgeon, and other fish stranded during placement and removal of cofferdams at the intake construction sites. This commitment is related to *AMM8 Fish Rescue and Salvage Plan*, described in Section 3B.4.8. The plans will identify the appropriate procedures for removing fish from the construction zone, and preventing fish from re-entering the construction zone during construction, or prior to dewatering. These plans will include detailed fish collection, holding, handling, and release procedures. These plans will be submitted to the appropriate resource agencies (California Department of Fish and Wildlife [CDFW], U.S. Fish and Wildlife Service [USFWS], and the National Marine Fisheries Service [NMFS]) for their review and acceptance. DWR, in undertaking construction at the construction sites, will develop a plan that includes the requirements set forth below, unless otherwise required by these permits or unless equally effective strategies are developed.

The appropriate fish collection method will be determined by a qualified fish biologist for all species of interest, in consultation with the designated resource agency biologist, and based on site-specific conditions prior to dewatering the cofferdam. Contact information provided by NMFS, USFWS, and CDFW will be supplied to the biologist on-site. Prior to construction site dewatering, fish will be captured and relocated to minimize direct mortality and other forms of take. Capture, release, and relocation measures will be consistent with the general guidelines and procedures set forth in Chapter 9 of the most recent edition of *California Salmonid Stream Habitat Restoration Manual* (California Department of Fish and Game 2010) to minimize impacts to species. Collection methods may include use of seines (nets) and/or dip nets to collect and remove fish, and electrofishing techniques may also be permitted.

All fish rescue and salvage operations will be conducted under the guidance of a qualified fish biologist. These activities will occur as soon as possible after completion of the activity which results in fish being trapped.

Unless otherwise required by these permits, or unless equally effective strategies are developed, the project proponents, in undertaking construction at the construction sites, will provide the following.

- A minimum 7-day notice to the appropriate fish regulatory agencies, prior to an anticipated activity that could result in isolating fish, such as installation of a cofferdam.
- A minimum 48-hour notice to the appropriate fish regulatory agencies of dewatering activities that are expected to require fish rescue.
- Safe working access for the appropriate fish regulatory agency personnel to the construction site for the duration of implementation of the fish rescue plan.
- Temporary cessation of dewatering if fish rescue workers determine that water levels may drop too quickly to allow successful rescue of fish.
- A work site that is accessible and safe for fish-rescue workers.

In some cases it may not be possible to conduct a fish rescue because of inaccessibility for electrofishing or seining to be conducted effectively, or where safety of field crews is compromised. In these situations, the onsite fish biologist, in consultation with the designated resource agency biologist, may determine that it is necessary to begin the dewatering process as a means of facilitating fish rescue. Dewatering may occur until the onsite fish biologist determines that conditions are made appropriate to conduct fish rescue operations. During the dewatering process, a qualified biologist or fish rescue team will be onsite with the aim of ensuring that take of covered fish is minimized to the maximum extent practicable. In the event that the on-site biologist determines that there is a more practicable and effective means to minimize impacts than specified in the Fish Rescue and Salvage Plan, the qualified biologist may propose such methods in lieu of those found in the Fish Rescue and Salvage Plan.

If fish rescue cannot be attempted (e.g., because of safety), a visual survey from the bank will be undertaken to document fish presence and the likely extent of effects. Binoculars will be used to identify fish; however, this method may not be feasible, if water clarity is low.

The fish rescue team will notify the contractor when the fish rescue has been completed and that dewatering can recommence. The results of the fish rescue and salvage operations (including date, time, location, comments, method of capture, fish species, number of fish, approximate age, condition, release location, and release time) will be reported to the appropriate resource agencies, as specified in the pertinent permits.

***Explanation of effectiveness:*** Implementation of this environmental commitment would minimize the number of Chinook salmon, steelhead, green sturgeon, delta smelt, and other covered fish stranded during project-related construction activities, especially during the placement and removal of cofferdams at the intake construction sites. The effectiveness of fish salvage and rescue in accomplishing this would be species-, site-, and method-specific, and mortality to fish species could occur during rescue and release operations. It is not likely that implementation of this environmental commitment alone would ensure less-than-significant construction-related impacts on covered fish species because these impacts are multi-faceted (i.e., the result of both temporary and permanent alteration of migration, spawning and rearing habitats due to underwater noise from pile driving, changes in water quality due to potential hazardous materials spills and turbidity, for example). Other environmental commitments (e.g., those requiring SWPPPs, spill prevention, containment, and countermeasure plans, hazardous materials management plans, and barge operations plan) would also be implemented to help reduce the severity of these impacts to a less-

than-significant level. Additionally, implementation of mitigation measures for significant impacts on multiple fish species underwater noise due to pile driving would be relied upon to reduce these impacts to a less-than-significant level (e.g., Impact AQUA-1, Impact AQUA-19, and Impact AQUA-37).

### 3B.2.8 Develop and Implement a Barge Operations Plan

To address the following potential impacts on aquatic habitat and species from barge and tugboat operations associated with water conveyance facilities construction, the Project proponents will ensure that a barge operations plan is developed and implemented for each project that requires the use of a barge. This commitment is related to *AMM7 Barge Operations Plan*, described in Section 3B.4.7. This plan will be developed and submitted by the construction contractors per standard DWR contract specifications as part of the traffic plans required by those specifications (see Section 01570 of standard DWR construction contracts<sup>12</sup>). The barge operations plan will be part of a comprehensive traffic control plan coordinated with the Coast Guard for large channels. The comprehensive traffic control plan will address traffic routes and machines used to deliver materials to and from the barges, and the following. DWR, in undertaking construction at the construction sites, will develop a barge operations plan that includes the requirements set forth below, unless equally effective strategies are developed.

- Bottom scour from propeller wash.
- Bank erosion or loss of submerged or emergent vegetation from propeller wash and/or excessive wake.
- Accidental material spillage.
- Sediment and benthic (bottom-dwelling) community disturbance from accidental or intentional barge grounding or deployment of barge spuds (extendable shafts for temporarily maintaining barge position).
- Hazardous materials spills (e.g. fuel, oil, hydraulic fluids).
- Introduction of aquatic invasive species.

The plan will be developed to limit barge-related effects on aquatic species. The plan will include provisions to minimize or reduce effects on aquatic species.

The plan will serve as a guide to barge operations and to a Biological Monitor who will evaluate barge operations on a daily basis during construction with respect to stated performance measures.

Project proponents will ensure that the barge plan will be implemented by barge operators and kept aboard all vessels operating at the project construction sites and barge landings.

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<sup>12</sup> In 2002 DWR developed standard specifications for contractors to follow when constructing projects. These specifications are designed to protect environmental resources, including air quality, at the project site. The contractor must meet all State and federal environmental statutes, rules, regulations, and policies enacted to protect the environmental resources and ensure that any significant environmental impacts of projects are identified and adequately mitigated. As part of this mitigation, contractors must develop and submit detailed plans including, but not limited to, an Air Quality Control Plan, Traffic and Noise Abatement Plan, and a Fire Prevention and Control Plan.

### 3B.2.8.1 Sensitive Resources

This plan is intended to protect aquatic species and habitat in the vicinity of barge operations. The plan will be developed to avoid barge-related effects on aquatic species; if and when avoidance is not feasible, the plan will include provisions to minimize effects on aquatic species. The sensitive resources potentially affected by barge maneuvering and anchoring in affected areas are listed below.

- Sediments that could cause turbidity or changes in bathymetry, if disturbed.
- Bottom-dwelling (benthic) invertebrates that provide the prey base for a number of aquatic species.
- Riparian vegetation that provides shade, cover, habitat structure, and organic nutrients to the aquatic environment.
- Submerged aquatic vegetation that provides habitat structure and primary (plant) production.
- Transport and introduction of invasive aquatic species (plants, fish and animals).

### 3B.2.8.2 Responsibilities

Construction contractors operating barges in the process of constructing the project's water conveyance facilities will be responsible for the following.

- Operating vessels safely and following this plan and other reasonable measures to minimize adverse effects on aquatic resources of the Delta.
- Reading, understanding, and following the barge operations plan.
- Reporting to the Project Biological Monitor any vessel grounding or other deviations from this plan that could have resulted in the disturbance of bottom sediments, damage to river banks, or loss of submerged, emergent, or riparian vegetation.
- Immediate reporting of material fuel or oil spills to the CDFW Office of Spill Prevention and Response (OSPR), the Project Biological Monitor, and DWR.
- Implementing all other relevant plans, including the hazardous materials management plans; SWPPPs; and the spill prevention, containment, and countermeasures plans.

The Biological Monitor will be responsible for the following.

- Observing a sample of barge operation activities including loading and unloading at least one barge at each of the barge loading and unloading facilities.
- Same-day reporting to DWR of any observed problems with barge operations.
- Monitoring during construction will include observation of barge landing, loading, unloading, and departure of one or more barges at each active barge landing site; the condition of both river banks at each landing site, and visual inspection for invasive aquatic species on in-water equipment such as barges and small work boats. Annual reporting to DWR a summary of monitoring observations over the course of each construction year, including an evaluation of the plan performance measures. The annual report will also include a description of, and representative photographs and/or videos of, conditions of river banks and vegetation.



- The success of this plan in protecting aquatic resources will be assessed by a qualified biologist. The Biological Monitor will visit each intake and barge landing site to determine the extent of emergent and riparian vegetation, bank conditions, and general site conditions during the growing season prior to initiation of construction and then annually during construction and upon completion of construction.

### **3B.2.8.3 Barge Avoidance and Minimization Measures**

The following measures will be implemented to ensure that the goal of minimizing impacts on aquatic resources from tugboat and barge operations will be achieved.

If deviations from these procedures are required to maintain the safety of vessels and crew, the Biological Monitor will be informed of the circumstances. If there appear to be impacts on water quality, habitats, fish, or wildlife, such impacts will be brought to the attention of DWR to ascertain and implement appropriate remedial measures as required.

#### **3B.2.8.3.1 Environmental Training**

Project proponents will ensure that tugboat pilots will implement this plan and to keep a copy of the plan aboard and accessible while working at these sites. Project proponents will ensure that all tugboat crew members responsible for piloting a vessel at either the intake or barge landing sites will read and agree to comply fully with this plan.

#### **3B.2.8.3.2 Dock Approach and Departure Protocol**

Project proponents will develop and implement a protocol for dock approach and departure to ensure the following.

- Vessel operators will comply with all federal and state navigation regulations that apply to the Sacramento Delta.
- All vessels will approach and depart from the intake and barge landing sites at dead slow to reduce vessel wake and propeller wash at the sites frequented by tug and barge traffic.
- To minimize bottom disturbance, anchors and barge spuds will be used to secure vessels only when it is not possible to tie up.
- Barge anchoring will be pre-planned to avoid sensitive resources: sediment issues, benthic invertebrates, riparian vegetation and submerged aquatic vegetation. Anchors will be lowered into place and not be allowed to drag across the channel bed.
- Vessel operators will limit vessel speed as necessary to maintain wakes of less than 2 feet (66 centimeters) at shore.
- Vessel operators will avoid pushing stationary vessels up against the cofferdam, dock or other structures for extended periods since this could result in excessive directed propeller wash impinging on a single location. Barges will be tied up whenever possible to avoid the need to maintain stationary position by tugboat or by the use of barge spuds.
- Barges will not be anchored where they will ground during low tides.
- All tugboats will comply with U.S. Coast Guard regulations related to the prevention, notification, and cleanup of hazardous materials spills.

- All vessels will keep an oil spill containment kit and spill prevention and response plan on-board.
- In the event of a fuel spill, it will be reported immediately to the CDFW Office of Spills Prevention and Response: 800-852-7550 or 800-OILS-911 (800-645-7911).
- When transporting loose materials (e.g., sand, aggregate), barges will use deck walls or take other containment measures to prevent loose materials from blowing or washing off of the deck.

#### 3B.2.8.4 Performance Measures

Performance or effectiveness of the measures implemented under the barge operations plan will be assessed based on the results of the biological monitoring reports. The assessment will evaluate observations for the following indicators of impacts.

- **Emergent vegetation loss.** The extent of emergent vegetation and the dominant species in such vegetation will be determined and mapped by GPS at and across the channel from each of the intake and barge landing sites during the growing seasons prior to, during, and upon completion of construction. The extent will be mapped as linear coverage along the landing and opposite banks. In the event that the linear extent of emergent vegetation is found to have decreased by 20% or more following construction (or as otherwise conditioned by applicable Department of Fish and Wildlife streambed alteration agreements), the position and nature of the change will be evaluated for the probability that the loss was due to barge grounding, propeller wash, or other effects related to barge operations. Adequate performance will be achieved if the linear extent of riparian and emergent vegetation following construction is at least 80% of the preconstruction extent (or as otherwise conditioned by applicable permits).
- **Bank erosion and riparian vegetation loss.** The linear extent of bank erosion will be mapped by GPS at each of the intake and barge landing sites prior to, during, and upon completion of construction. Photos and written descriptions will be recorded for each area of eroded bank to describe the extent of the erosion. In the event that the linear extent of eroded bank is found to have increased by 20% or more following construction, the position and nature of the change will be evaluated for the probability (low, moderate, or high) that the erosion was due to barge grounding, propeller wash, or other effects related to barge operations. Pre- and post-construction photographs will be compared to determine if riparian vegetation was also lost as a result of the erosion. If barge operations were concluded to have eroded 20% or more of a bank, project proponents would hire a qualified restoration specialist to restore the bank.
- **Cargo containment.** The biological monitor will note the use of deck walls or other appropriate containment measures during loading and unloading of sand, aggregate or other materials from a barge at each landing site. Adequate performance will be achieved if appropriate measures are in use during each observed loading and unloading. In the event that an accidental spill occurs in spite of appropriate containment, the barge crew will describe the type, amount, and location of the spill to the biological monitor. The biological monitor will make observations at the site of the material spill and evaluate the potential impacts of the spill on biological resources for evaluation of whether mitigation is required, and for inclusion in the annual monitoring report. A harmful quantity is any quantity of discharged material that violates state water quality standards. Any such impacts will be brought to the attention of the applicable resource agency in order to ascertain and implement appropriate remedial measures.

- 1     • **Fuels spill prevention.** Vessels operating in accordance with the spill prevention, containment,  
2     and countermeasures plans (a component of the hazardous materials management plans  
3     described in Section 3B.2.12.), and all applicable federal, State, and local safety and  
4     environmental laws and policies governing commercial tugboat and barge operations, will be  
5     considered to be performing adequately with regard to fuel spill prevention.
- 6     • **Barge grounding.** Because barge grounding has the potential to disturb bottom sediments and  
7     benthic organisms, as well as creating a temporary obstacle to fish passage, barges are not to be  
8     grounded or anchored where falling tides are reasonably expected to cause grounding during  
9     low tide. Performance will be considered adequate if no cases of vessel grounding occur.

10    ***Explanation of effectiveness:*** Development and implementation of a barge operations plan for  
11    applicable project locations would help reduce the severity of construction-related impacts on  
12    covered fish species and their habitat, water quality impacts due to inadvertent release of hazardous  
13    materials, as well impacts on recreational fishing opportunities. These impacts would be minimized  
14    primarily through the following measures, as described above: training of tugboat operators;  
15    limiting vessel speed to minimize the effects of wake impinging on unarmored or vegetated banks  
16    and the potential for vessel wake to strand small fish; limiting the direction and/or velocity of  
17    propeller wash to minimize bottom scour and loss of aquatic vegetation; and adhering to all relevant  
18    environmental guidelines, regulations and associated environmental commitments (including  
19    hazardous materials management plans, SWPPPs, and Spill Prevention, Containment, and  
20    Countermeasure Plans). However, this environmental commitment alone would not be sufficient to  
21    ensure less-than-significant impacts on aquatic and associated recreational resources. In addition to  
22    other environmental commitments intended to minimize impacts on water quality, certain impacts  
23    for which a barge operations plan would be relied upon, such as Impact REC-4 (long-term reduction  
24    of recreational fishing opportunities as a result of construction the water conveyance facilities),  
25    would still require mitigation measures to reduce a significant impact to a less-than-significant level  
26    (e.g., Impact REC-2, and Impacts AQUA-1a and AQUA-1b).

## 27    **3B.2.9           Construction Equipment Exhaust Reduction Plan**

28    Prior to construction, Project proponents will develop a construction equipment exhaust reduction  
29    plan to reduce criteria air pollutants from construction equipment. The reduction plan will be  
30    provided to the appropriate Plan Area air districts for review prior to construction. Control  
31    technology that achieves equivalent or greater reductions than those identified below may be  
32    specified as new emissions reduction technologies become available and cost-effective.

### 33    **3B.2.9.1       Off-Road Heavy-Duty Engines**

34    The reduction plan will require that equipment used to construct project facilities achieve fleet-wide  
35    average criteria pollutant emissions rates for equipment greater than 50 horsepower that are  
36    equivalent to the use of a model year 2013 fleet. Prior to construction start for each major project  
37    feature, Project proponents will ensure model year 2013 emissions rates are achieved by developing  
38    a-specific construction equipment exhaust reduction plan. Contractors may utilize a combination of  
39    newer engines, aftermarket controls, and retrofits to achieve the fleet-wide average performance  
40    standard. Potential strategies for achieving this fleet-wide average may include the following:

- 41    • Electrification of equipment
- 42    • Use of diesel particulate filters on non-electrified equipment.

- Use of compressed natural gas (CNG).
- Use of Tier 4 engines.

The Project proponents will quantitatively demonstrate, through equipment-specific modeling, that fleet-wide average achieve criteria pollutant emissions rates for equipment greater than 50 horsepower that are equivalent to the use of a model year 2013 fleet have been achieved by the selected equipment and aftermarket controls. As noted in Appendix 22A, *Air Quality Analysis Methodology*, the air quality analysis and Health Risk Assessment have been performed based on model year 2013 emission factors obtained from the Sacramento Metropolitan Air Quality Management District's Construction Mitigation Calculator. The 2013 model year emission factors for each equipment piece are built from the zero-hour emissions rates, annual deterioration rates, and assumptions about engine operating hours.

In addition to the model year 2013 performance standard, the following best management practices will be incorporated into the reduction plan.

- Minimize idling time either by shutting equipment off when not in use or limiting the time of idling to 3 minutes (5 minutes required by 13 CCR 2449[d][3], 2485). Provide clear signage that posts this requirement for workers at the entrances to the site.
- Maintain all construction equipment in proper working condition according to manufacturer's specifications. The equipment must be checked by an ASE- certified mechanic and determined to be running in proper condition before it is placed in operation.
- Ensure that emissions from all off-road diesel-powered equipment used on the project site do not exceed 40% opacity for more than 3 minutes in any 1 hour. Any equipment found to exceed 40% opacity (or Ringelmann 2.0<sup>13</sup>) will be repaired immediately. Noncompliant equipment will be documented and a summary provided annually to the lead agency and air district with jurisdiction over the construction site. A visual inspection of all in-operation equipment will be made at least weekly by the contractor and witnessed monthly or more frequently by the proponent agency(ies), and a periodic summary of the visual survey results will be submitted by the contractor throughout the duration of the proposed project, except that the summary will not be required for any 30-day period in which no construction activity occurs. The summary will include the quantity and type of vehicles inspected, as well as the dates of each survey. The air districts or other officials may conduct periodic site inspections to determine compliance. Nothing in this measure will supersede other air district or state rules or regulations.

**Explanation of effectiveness:** These BMPs are proven, standard measures that minimize the generation of criteria air pollutants and GHG emission from construction equipment. Accordingly, implementation of the construction equipment exhaust plan would help reduce the severity of potential public health and climate change impacts from these project-related emissions. However, as discussed in Chapter 22, *Air Quality and Greenhouse Gases*, implementation of these BMPs alone would not be sufficient to reduce significant impacts to a less-than-significant level. For these impacts (e.g., Impacts AQ-1, AQ-2, AQ-3, AQ-9, and AQ-16) mitigation measures would be implemented to further minimize the severity of the impacts. Even then, the impacts for some alternatives would be significant and unavoidable (see Table ES-8 in the Final EIR/EIS Executive Summary, Chapter 22 for details).

<sup>13</sup> Based on the Ringelmann scale, which measures the density of smoke in the air.

### 3B.2.9.2 Marine Vessels

Prior to construction start for each major project feature, Project proponents will ensure that all marine vessels used to construct project facilities utilize U.S. Environmental Protection Agency (USEPA) certified Tier 3 or newer engines. As noted in Appendix 22A, *Air Quality Analysis Methodology*, the air quality analysis and HRA have been performed based on model year 2010 emission factors (Tier 3 compliance for new engines) obtained from the ARB (2012b).

### 3B.2.9.3 Heavy Duty Haul Trucks

Prior to construction start for each major project feature Project proponents will ensure that all on-road heavy-duty diesel trucks with a gross vehicle weight rating of 19,500 pounds or greater used to construct project facilities comply with USEPA 2007 on-road emission standards for PM<sub>10</sub> and NO<sub>x</sub> (0.01 g/bhp-hr and 0.20 g/bhp-hr, respectively). These PM<sub>10</sub> and NO<sub>x</sub> standards were phased in through the 2007 and 2010 model years on a percent of sales basis (50% of sales in 2007 to 2009 and 100% of sales in 2010). As noted in Appendix 22A, *Air Quality Analysis Methodology*, the air quality analysis and Health Risk Assessment have been performed based on model year 2010 emission factors obtained from the ARB's EMFAC2014 model.

### 3B.2.9.4 Locomotives

Prior to construction start for each major project feature Project proponents will ensure that all diesel tunneling locomotives used to construct project facilities utilize USEPA certified Tier 4 or newer engines.

**Explanation of effectiveness:** This environmental commitment will reduce criteria air pollutants from construction equipment by including performance standards for newer and cleaner off-road equipment, marine vessels, and haul trucks, and requiring all tunneling locomotives to utilize Tier 4 engines. However, some impacts related to generation of criteria pollutants, such as PM<sub>10</sub>, ROG and NO<sub>x</sub> emissions, would still exceed air quality district thresholds and would remain significant and unavoidable. This environmental commitment would also lessen effects related to alteration in existing visual quality or character during construction of conveyance facilities, as described in Impact AES-1 of Chapter 17, *Aesthetic and Visual Resources*. Earthmoving activities and associated heavy equipment and vehicles would be readily visible throughout operation of these sites and have the potential to create dust clouds that would attract attention from visual receptors and reduce the availability of short-range views. This commitment would reduce emissions of construction-related criteria pollutants, including basic and enhanced fugitive dust control measures and measures for entrained road dust to help reduce the creation of dust clouds that would negatively affect short-range views. However, this environmental commitment, along with mitigation measures, would still not reduce impacts fully, and impacts related to visual quality or character would remain significant and unavoidable.

## 3B.2.10 DWR Construction Best Management Practices to Reduce GHG Emissions

Project proponents will implement the following applicable GHG reduction measures, which are outlined in DWR's Climate Action Plan.

### 3B.2.10.1 Preconstruction and Final Design BMPs

Preconstruction and Final Design BMPs are designed to ensure that individual projects are evaluated and their unique characteristics taken into consideration when determining if specific equipment, procedures, or material requirements are feasible and efficacious for reducing GHG emissions from the project.

**BMP 1.** Evaluate project characteristics, including location, project work flow, site conditions, and equipment performance requirements, to determine whether specifications of the use of equipment with repowered engines, electric drive trains, or other high efficiency technologies are appropriate and feasible for the project or specific elements of the project.

**BMP 2.** Evaluate the feasibility and efficacy of performing on-site material hauling with trucks equipped with on-road engines.

**BMP 3.** Ensure that all economically feasible avenues have been explored for providing an electrical service drop to the construction site for temporary construction power. When generators must be used, consider use of alternative fuels, such as propane or solar, to power generators to the maximum extent feasible, as specified in construction contracts.

**BMP 4.** Evaluate the feasibility and efficacy of producing concrete on-site and specify that batch plants be set up on-site or as close to the site as possible.

**BMP 5.** Evaluate the performance requirements for concrete used on the project and specify concrete mix designs that minimize GHG emissions from cement production and curing while preserving all required performance characteristics.

**BMP 6.** Limit deliveries of materials and equipment to the site to off peak traffic congestion hours. (This BMP is applicable only for deliveries of materials and equipment to the geotechnical exploration sites and transported on public roadways).

### 3B.2.10.2 Construction BMPs

Construction BMPs apply to all construction and maintenance projects that DWR completes or for which DWR issues contracts. All projects are expected to implement all Construction BMPs unless a variance is granted by the Division of Engineering Chief, Division of Operation and Maintenance Chief, or Division of Flood Management Chief, as applicable, and the variance is approved by the DWR CEQA Climate Change Committee. Variances will be granted when specific project conditions or characteristics make implementation of the BMP infeasible and where omitting the BMP will not be detrimental to the project's consistency with the Greenhouse Gas Reduction Plan (DWR's Climate Action Plan).

**BMP 7.** Minimize idling time by requiring that equipment be shut down after five minutes when not in use (as required by the State airborne toxics control measure [13 CCR Section 2485]). Provide clear signage that posts this requirement for workers at the entrances to the site and provide a plan for the enforcement of this requirement.

**BMP 8.** Maintain all construction equipment in proper working condition and perform all preventative maintenance. Required maintenance includes compliance with all manufacturer's recommendations, proper upkeep and replacement of filters and mufflers, and maintenance of all

engine and emissions systems in proper operating condition. Maintenance schedules shall be detailed in an Air Quality Control Plan prior to commencement of construction.

**BMP 9.** Implement tire inflation program on jobsite to ensure that equipment tires are correctly inflated. Check tire inflation when equipment arrives onsite and every two weeks for equipment that remains onsite. Check vehicles used for hauling materials offsite weekly for correct tire inflation. Procedures for the tire inflation program shall be documented in an Air Quality Management Plan prior to commencement of construction.

**BMP 10.** Develop a project specific ride share program to encourage carpools, shuttle vans, transit passes and/or secure bicycle parking for construction worker commutes.

**BMP 11.** Reduce electricity use in temporary construction offices by using high efficiency lighting and requiring that heating and cooling units be Energy Star compliant. Require that all contractors implement procedures for turning off computers, lights, air conditioners, heaters, and other equipment each day at close of business.

**BMP 12.** For deliveries to project sites where the haul distance exceeds 100 miles and a heavy-duty class 7 or class 8 semi-truck or 53-foot or longer box type trailer is used for hauling, a SmartWay<sup>26</sup> certified truck will be used to the maximum extent feasible.

**BMP 13.** Minimize the amount of cement in concrete by specifying higher levels of cementitious material alternatives, larger aggregate, longer final set times, or lower maximum strength where appropriate.

**BMP 14.** Develop a project specific construction debris recycling and diversion program to achieve a documented 50% diversion of construction waste.

**BMP 15.** Evaluate the feasibility of restricting all material hauling on public roadways to off-peak traffic congestion hours. During construction scheduling and execution minimize, to the extent possible, uses of public roadways that would increase traffic congestion.

**Explanation of effectiveness:** These preconstruction and construction BMPs were developed to achieve GHG emissions reductions in accordance with meeting DWR's GHG emissions reduction goals, which are detailed in the Climate Action Plan Phase I (California Department of Water Resources 2012). Implementation of these BMPs as part of the project would help minimize the generation of cumulative GHG emissions during construction of the proposed water conveyance facilities by minimizing fuel consumption by construction equipment and transportation of materials; reducing electricity consumption during construction; reducing the amount of landfill material; and reducing emissions from cement production. However, as described in Chapter 22, *Air Quality and Greenhouse Gases*, any substantial increase in construction-related GHG emissions above net zero (0) would result in a significant impact, which would necessitate mitigation to reduce the impact to less than significant (Mitigation Measure AQ-21: Develop and Implement a GHG Mitigation Program to Reduce Construction Related GHG Emissions to Net Zero [0]).

### 3B.2.11 Develop and Implement Noise Abatement Plan

DWR and contractors hired to construct any conveyance components of the project will implement a site-specific noise abatement plan to avoid or reduce potential construction-, maintenance-, and operation-related noise impacts. This commitment is related to *AMM31 Noise Abatement*, and *AMM9 Underwater Sound Control and Abatement Plan*, described in Sections 3B.4.31 and 3B.4.9. The noise

abatement plan will include measures such as restrictions on use of construction equipment outside of daytime hours, requiring use of noise reducing technologies for construction equipment, installation of temporary barriers or enclosures to reduce construction noise at sensitive receptors, and local coordination efforts to reduce noise effects on sensitive uses including but not limited to schools, parks, places of worship, and residential uses. As applicable, the following components will be included in the plan.

### **3B.2.11.1 Construction and Maintenance Noise**

The contractor will employ best practices to reduce construction noise.

- Contracts shall specify that on-site construction practices will comply with the measures identified below. Exceptions to these restrictions may be permitted for legally mandated back-up alarms, warning horns and similar devices. Inaudible safety measures, such as flaggers and worker access restrictions to construction areas, may be considered on a case-by-case basis, and shall be used where feasible and necessary to reduce noise to acceptable levels.
- Limit impact pile driving to the hours between 7 a.m. and 7 p.m.
- Locate, store, and maintain portable and stationary equipment as far as feasible from nearby residents.
- At a given noise-sensitive land use that includes an outdoor area of frequent human use (i.e. residential yards, parks, schools, playgrounds, places of worship, swimming pools, recreation areas, campgrounds, sports courts, and outdoor areas associated with institutional use), where it is determined that construction-related noise will cause noise levels to exceed the daytime ambient level by 5 A-weighted decibels (dBA), or 60 dBA  $L_{eq}$ ,<sup>14</sup> whichever is greater, at noise sensitive receptors, a temporary sound barrier shall be constructed between the outdoor use area and the construction related noise source.
- At buildings where people normally sleep, where it is determined that construction-related noise will cause noise levels to exceed the nighttime ambient level by 5 dBA, or 50 dBA  $L_{eq}$ , whichever is greater, a temporary sound barrier shall be constructed between the sensitive area and the construction related noise source.
- In the event of complaints by affected residents due to on-site construction noise generated during nighttime hours, the contractor will monitor noise levels intermittently (between 10:00 p.m. and 7:00 a.m.) at the dwelling unit of the person lodging the complaint.<sup>15</sup> If measured construction noise during nighttime hours exceeds 50 dBA interior  $L_{max}$ <sup>16</sup> (70 dBA exterior  $L_{max}$ ) or 5 dB above ambient noise, whichever is greater, at the dwelling unit, the construction contractor will implement additional sound-attenuating mitigation measures where site conditions allow, such as limitations on the use of noise-generating equipment, or installation of additional temporary barriers or enclosures. Where the above-described strategies are ineffective in reducing noise to the identified levels or where site conditions prohibit the ability

<sup>14</sup> A-weighted sound levels are typically measured or presented as  $L_{eq}$ , which is defined as the average sound level for a stated period of time.

<sup>15</sup> In contrast to the 50 dBA  $L_{eq}$  standard for nighttime construction noise, the 50 dBA interior  $L_{max}$  threshold (or 70 dBA exterior  $L_{max}$ ) is used to address the potential for sleep disturbance during nighttime construction.

<sup>16</sup> The maximum sound pressure level over a defined period



to do so, the affected residents<sup>17</sup> shall be offered short-term relocation assistance for the duration of the time that nighttime noise levels are expected to exceed the specified levels. Exceptions to this commitment can be made for legally-mandated warning devices, such as back-up alarms and warning horns.

- To the extent feasible, route and schedule truck traffic in order to reduce construction noise impacts and traffic noise levels at noise-sensitive land uses (e.g., schools, libraries, and places of worship).
- To the extent feasible (e.g., where required by haul permits), limit off-site trucking activities (e.g., deliveries, export of materials) to the hours of 7:00 a.m. to 10:00 p.m. to minimize noise impacts on nearby residences.
- A vegetation screen or other type of screen will be installed or planted on the south side of Hood Franklin Road along the length of Stone Lakes National Wildlife Refuge Property to reduce disturbance to Greater Sandhill Cranes and to visitors.
- Blasting at excavation sites will be conducted at a distance of at least 1,000 feet from the nearest noise-sensitive land use or temporary relocation will be provided.

### 3B.2.11.2 Operation Noise

Pump station buildings will be designed and constructed such that operation noise levels at nearby residential receptors do not exceed 50  $L_{eq}$  during daytime hours (7:00 a.m. to 10:00 p.m.) and 45 dBA  $L_{eq}$  during nighttime hours (10 p.m. to 7 a.m.). Acoustical measures such as terrain shielding, pump enclosures, and acoustical building treatments will be incorporated into the facility design in order to meet this performance standard.

**Explanation of effectiveness:** Implementation of the proposed project would increase noise levels near construction and maintenance work areas and from operation of some permanent project facilities. In some locations, the increases in noise levels would exceed maximum daytime and nighttime noise thresholds and could adversely affect sensitive land uses including residents, schools, hospitals, or similar facilities, as well as recreational activities, such as fishing, waterfowl hunting, wildlife viewing, hiking, and environmental education opportunities. Nighttime construction (e.g., conveyance tunnel construction and RTM work areas) could affect residential areas and campgrounds. Pile-driving, drilling, and tunnel locomotives would result in increased vibration or groundborne noise levels that could also exceed relevant vibration thresholds and adversely affect nearby sensitive land uses or wildlife.

In addition, implementation of the action alternatives has the potential to result in changes to community character by increasing ambient noise levels that contribute to the rural quality of areas near the project. Under each alternative elevated noise levels could contribute to impacts on community cohesion by restricting mobility, reducing opportunities for maintaining face-to-face relationships or disrupting the functions of community organizations or community gathering places (e.g., schools, libraries, churches, chambers of commerce). In instances of more severe or long-term noise impacts, implementation of the project could contribute to localized abandonment of buildings.

<sup>17</sup> Permanent residents or tenants of rental dwelling units.

Finally, the effect of exposing noise-sensitive land uses to noise increases, including groundborne vibration, above relevant thresholds is considered adverse, and because the noise and vibration effects of the proposed project would occur in areas with meaningfully greater minority and low-income populations in Sacramento and San Joaquin Counties (under Alternative 4), there would be a disproportionate effect on these populations.

Elevated noise levels associated with construction of water conveyance facilities would result in short-term and long-term impacts on water-dependent, water-enhanced, and land-based recreation sites, activities, and opportunities. Construction includes above-ground as well as underground tunneling and train/transport of workers and materials. Although the severity of the impact (noise level and duration of the construction) would vary depending on the project component under construction (e.g., intake structure, power transmission lines, access roads, borrow/spoil area, or other structures or type of work areas) and the proximity and type of recreational uses in the vicinity. Construction related to habitat restoration measures, although of lower intensity and shorter duration, also would have impacts from earthwork and site preparation for the restoration, enhancement, protection, and management of various natural community types resulting in increased noise levels that would affect nearby sensitive land uses or wildlife and related recreation. Maintenance of the water conveyance facilities and of the restoration areas and facilities would have similar, but shorter-term effects.

Impacts include degradation of the recreation setting, disturbances to fish and wildlife that affect wildlife viewing, sport-fishing (on-bank and by boat), boating, waterfowl hunting, photography, environmental education, or other related recreational opportunities. This lower-quality recreational experience in areas throughout the project area, and especially the Delta region, could lead to a decline in visits to Delta recreational sites, reduced recreation-related spending and potentially cause adverse social and economic effects on local recreation-related businesses.

Implementation of a Noise Abatement Plan, in combination with mitigation measures and AMMs, would reduce the severity of these impacts, although it would not reduce impacts to less-than-significant levels at all locations. The Noise Abatement Plan would result in implementation of measures to ensure construction noise levels do not exceed applicable local noise ordinance standards for daytime and nighttime noise levels, to the extent practicable. The Noise Abatement Plan would also reduce impacts by limiting pile driving to daytime hours (no evening or nighttime pile driving) and by locating portable and stationary equipment as far as possible from residential areas. Construction contractors also would route and schedule truck traffic and limit off-site trucking (hauling) activities to reduce noise-related impacts on nearby land uses. In locations where residents complain of excessive nighttime noise levels, the Noise Abatement Plan would call for noise level monitoring and reduction to a level of 50 dBA interior  $L_{max}$  (70 dBA exterior  $L_{max}$ ) or 5 dB above ambient noise, whichever is greater. These measures directly address the impact mechanisms described above, and would reduce the severity of impacts caused by noise levels on noise-sensitive land uses and wildlife by reducing noise levels to those permitted by local ordinances or standards.

This environmental commitment in combination with Mitigation Measures NOI-1a would reduce the impacts of construction noise on noise-sensitive land uses. However, because not all construction-related noise levels can be kept below the noise standards during all types of construction activities or in all locations (i.e., pile driving, back-up alarms, and warning horns and devices), the environmental commitment, even in combination with mitigation measures, would not fully reduce the level of impact on noise-sensitive land uses, including recreation-related opportunities, to less than significant.

Similarly, although additional mitigation measures for vibration/groundborne noise, terrestrial biological resources, and aquatic resources, and AMMs are designed and would be implemented to minimize the impacts of elevated construction-related noise and groundborne vibration levels on sensitive land uses and wildlife, these impacts cannot be fully mitigated in all locations.

The Noise Abatement Plan, in combination with Mitigation Measure NOI-3, would also ensure pump station facilities would be designed so that operational noise levels would not exceed local noise standards and impacts on nearby sensitive land uses would be reduced to less than significant.

### **3B.2.12 Develop and Implement Hazardous Materials Management Plans**

The project proponents will ensure that each project contractor responsible for construction of a project facility or project will develop and implement a hazardous materials management plan (HMMP) before beginning construction. This commitment is related to *AMM32 Hazardous Materials Management*, described in Section 3B.4.32. It is anticipated that multiple HMMPs will be prepared for the overall project construction activities, each taking into account site-specific conditions such as hazardous materials present on site and known historic site contamination. A database on known historic instances of contamination and results of any field inspections regarding the presence of hazardous chemicals will be maintained. The HMMPs will provide detailed information on the types of hazardous materials used or stored at all sites associated with the water conveyance facilities (e.g., intake pumping plants, maintenance facilities); phone numbers of applicable city, county, state, and federal emergency response agencies; primary, secondary, and final cleanup procedures; emergency-response procedures in case of a spill; and other applicable information. The plan will include appropriate practices to reduce the likelihood of a spill of toxic chemicals and other hazardous materials during construction and facilities operation and maintenance. A specific protocol for the proper handling and disposal of hazardous materials will be established before construction activities begin and will be implemented during project construction.

The HMMP will include, but not be limited to, the following measures or practices.

- Fuel, oil, and other petroleum products will be stored only at designated sites.
- Hazardous materials containment containers will be clearly labeled with the identity of the hazardous materials contained therein, handling and safety instructions, and emergency contact information.
- Storage, use, or transfer of hazardous materials in or near wet or dry streams will be consistent with the Fish and Game Code (Section 5650) and/or with the permission of CDFW.
- Material Safety Data Sheets (MSDS) will be made readily available to the contractor's employees and other personnel at the work site.
- The accumulation and temporary storage of hazardous wastes will not exceed 90 days.
- Soils contaminated by spills or cleaning wastes will be contained and removed to an approved disposal site by an appropriately-certified hazardous waste disposal contractor.
- Hazardous waste generated at work sites, such as contaminated soil, will be segregated from other construction spoils and properly handled, hauled, and disposed of at an approved disposal facility by a licensed hazardous waste hauler in accordance with applicable law and regulations. The contractor will obtain permits required for such disposal.

- Emergency spill containment and cleanup kits will be located at the work site. The contents of the kit will be appropriate to the type and quantities of chemical or goods stored at the work site.

**Explanation of effectiveness:** Implementation of multiple, site-specific HMMPs during construction and operation of the water conveyance facilities, the habitat restoration and enhancement measures, and the measures to reduce stressors, would avoid or minimize the potentially significant impacts on the public and environment related to hazardous materials spills and improper storage and use of hazardous materials. Incorporation of the aforementioned HMMP measures or practices, as well as others, into the proposed project would safeguard public health and the environment from accidental releases of hazardous chemicals, including potentially contaminated soil, and fuel and oil, through advanced planning for material use and management, employee training, and spill prevention, management, and cleanup. Absent implementation of these basic BMPs and perhaps other more site-specific measures as part of the project, there would be a greater potential for improper storage, handling and use of hazardous materials, which could result in inadvertent releases of hazardous materials and associated adverse effects/significant impacts on the public and environment. Significant impacts on fish species, long-term recreational fishing opportunities and associated direct and indirect changes in community character from hazardous spills would be minimized, as would the demand for emergency or fire services.

### 3B.2.13 Develop and Implement Spill Prevention, Containment, and Countermeasure Plans

It is anticipated that multiple Spill Prevention, Containment, and Countermeasure Plans (SPCCPs) will be prepared for project construction activities, each taking into account site-specific conditions. This commitment is related to *AMM5 Spill Prevention, Containment, and Countermeasure Plan*, described in Section 3B.4.5. The SPCCPs will be developed in accordance with the regulatory requirements of Title 40 of the Code of Federal Regulations (CFR), Part 112, or the Spill Prevention, Control, and Countermeasure Rule, which includes requirements for oil spill prevention, preparedness, and response to prevent oil discharges to navigable waters and adjoining shorelines. The rule requires the preparation, amendment and implementation of SPCCPs for specific facilities. The SPCCPs will be developed and implemented to minimize effects from spills of oil or oil-containing products<sup>18</sup> during project construction and operation. The SPCCPs will include the following measures and practices.

- All necessary personnel will be trained in emergency response and spill containment techniques, and will also be made aware of the pollution control laws, rules, and regulations applicable to their work.
- Petroleum products will be stored in nonleaking containers at impervious storage sites from which an accidental spill cannot escape.
- Absorbent pads, pillows, socks, booms, and other spill containment materials will be stored and maintained at the hazardous materials storage sites for use in the event of an accidental spill.
- Contaminated absorbent pads, pillows, socks, booms, and other spill containment materials will be placed in nonleaking sealed containers until transport to an appropriate disposal facility.

<sup>18</sup> "Oil" includes a variety of petroleum and non-petroleum based substances including gasoline, diesel fuel, motor oil, hydraulic fluid, aviation fuel, oil-based paint, oil-based paint thinner, roofing tar, and petroleum-based solvents.

- 1 • When transferring oil or other hazardous materials from trucks to storage containers, absorbent  
2 pads, pillows, socks, booms or other spill containment material will be placed under the transfer  
3 area.
- 4 • Refueling of construction equipment will occur only in designated areas that will be a minimum  
5 of 150 feet from surface waters and other sensitive habitats, such as wetlands.
- 6 • Equipment used in direct contact with water will be inspected daily for oil, grease, and other  
7 petroleum products. All equipment must be cleaned of external petroleum products prior to  
8 beginning work where contact with water may occur to prevent the release of such products to  
9 surface waters.
- 10 • Oil-absorbent booms will be used when equipment is used in or immediately adjacent to waters.
- 11 • All reserve fuel supplies will be stored only within the confines of a designated staging area, to  
12 be located a minimum of 150 feet from surface waters and other sensitive habitats, such as  
13 wetlands.
- 14 • Fuel transfers will take place a minimum of 150 feet from surface waters and other sensitive  
15 habitats, such as wetlands, and absorbent pads will be placed under the fuel transfer operation.
- 16 • Staging areas will be designed to contain contaminants such as oil, grease, fuel, and other  
17 petroleum products so that should an accidental spill occur, they do not drain toward receiving  
18 waters or storm drain inlets.
- 19 • All stationary equipment will be staged in appropriate staging areas and positioned over drip  
20 pans.
- 21 • In the event of an accidental spill, personnel will identify and secure the source of the discharge  
22 and contain the discharge with sorbents, sandbags, or other material from spill kits and will  
23 contact appropriate regulatory authorities (e.g., National Response Center will be contacted if  
24 the spill threatens navigable waters of the United States or adjoining shorelines, as well as other  
25 appropriate response personnel).

26 Methods of cleanup may include the following.

- 27 • Physical—Physical methods for the cleanup of dry chemicals include the use of brooms, shovels,  
28 sweepers, or plows.
- 29 • Mechanical—Mechanical methods include, but may not be limited to, the use of vacuum cleaning  
30 systems and pumps.
- 31 • Chemical—Cleanups of material can be achieved with the use of appropriate chemical agents  
32 such as sorbents, gels, and foams.

33 ***Explanation of effectiveness:*** Implementation of multiple, site-specific SPCCPs during construction  
34 and operation of the water conveyance facilities, the habitat restoration and enhancement  
35 measures, as well as the conservation measures to reduce stressors, would reduce the severity of  
36 and/or avoid the potentially significant impacts on the public and environment related to spills of  
37 gasoline, diesel fuel, oil and other related substances. Absent implementation of these BMPs, there  
38 would be a greater potential for significant impacts on covered fish and terrestrial species, long-  
39 term recreational fishing opportunities, and the demand for emergency or fire services. However, it  
40 is unlikely that implementation of SPCCP BMPs alone would ensure less-than-significant  
41 construction-related water quality impacts. Other environmental commitments (e.g., SWPPPs and

hazardous materials management plans), would also be implemented to help reduce the severity of these impacts to a less-than-significant level. Additionally, for some impacts where SWPPP BMPs would be relied upon, mitigation measures would still be necessary to reduce a significant impact to a less-than-significant level (e.g., Impact HAZ-1, Impact HAZ-6, and Impact REC-4).

### **3B.2.14 Develop and Implement a Fire Prevention and Control Plan**

The project proponents will develop and implement a fire prevention and control plan in consultation with the appropriate fire suppression agencies to verify that the necessary fire prevention and response methods are included in the plan. The plan will include fire prevention and suppression measures, and will consider the policies and standards in the affected jurisdictions.

At a minimum, the following components, as applicable, will be included in the plan. If a component is not applicable, DWR or its contractor will explain in the plan why that component or a portion thereof is not included in the plan.

- If a fire should start, the appropriate fire protection agencies will be contacted immediately.
- Procedures and policies for controlling any fires that are on the work site, and other related fire prevention and control procedures developed in consultation with and fire protection agencies.
- Procedures for regular maintenance of safeguards installed on heat-producing equipment to prevent the accidental ignition of combustible materials.
- A list of all major potential fire hazards, proper handling and storage procedures for hazardous materials, potential ignition sources and their control, and the type of fire protection equipment necessary to control each potential major hazard.
- Smoking will be allowed only in areas designated for smoking, and these areas will be cleared of vegetation, or in enclosed vehicles. Cigarette butts are to be disposed of in car ashtrays or other approved disposal containers and dumped daily in a proper receptacle off the work site.
- The contractor will be responsible for maintaining appropriate fire suppression equipment at the work site including a water truck or fire truck with a water tank of at least 3,000 gallon capacity. Fire extinguishers, shovels and other firefighting equipment will be available at work sites and on appropriate construction equipment. The contractor will be required to ensure that each construction vehicle on the work site will be equipped with a minimum 20 pound (or two 10 pound) fire extinguisher(s).
- At the work site, a sealed fire toolbox will be located at a point accessible in the event of fire. This fire toolbox will contain: one back-pack pump-type extinguisher filled with water, two axes, two McLeod fire tools, and shovels so that employees at the work site can be equipped to fight fire.
- Gasoline-powered construction equipment with catalytic converters will be equipped with shielding or other acceptable fire prevention features. Internal combustion engines will be equipped with spark arrestors.
- Welding sites will include fire prevention provisions.

- The contractor will maintain contact with local firefighting agencies throughout the fire season for updates on fire conditions, and such fire conditions will be communicated daily to the on-site employees of the contractor and subcontractors daily.

In addition to the plan, fire protection will conform to the State Fire Marshal requirements, and will be in full compliance with Cal/OSHA standards for fire safety and prevention. Road designs will be developed in consultation with the State Fire Marshal. Any fire hydrants will be located as deemed acceptable by the State Fire Marshal and are to meet State government standards. Fire protection using water will be provided by a potable water system either from the nearest municipal clean water conveyance system or from a self-contained filtration and treatment system that takes water from an adjacent waterway or a site well or tank.

**Explanation of effectiveness:** Construction, operation, and maintenance of the water conveyance facilities and several other conservation measures would involve the use of equipment and ignitable materials, and would involve activities that could potentially start fires. Were fires to occur, particularly substantial fires, they could create an additional demand for fire protection service, and emergency medical services, result in changes to community character, and increase the risk of personal injury, death, and substantial loss of property, any one of which would be considered a significant impact. Implementation of these fire prevention and control measures would reduce the potential for these impacts to occur as well as reduce the severity, and therefore significance, of fire-related impacts to a less-than significant level.

### 3B.2.15 Prepare and Implement Mosquito Management Plans

**During Construction—**To aid in mosquito management and control during construction of the intakes, the project proponents will consult with appropriate Mosquito and Vector Control Districts (MVCDs). Consultation will occur with the following MVCDs: San Joaquin County Mosquito and Vector Control District and Sacramento-Yolo Mosquito and Vector Control District. This commitment is related to *AMM33 Mosquito Management*, described in Section 3B.4.33. Consultation will occur before the sedimentation basins, solids lagoons, modified Clifton Court Forebay, and the intermediate forebay inundation area become operational. Once these components are operational, the project proponents will consult again with the MVCDs to determine if mosquito populations are beyond thresholds as defined in Mosquito Management Plan. The project proponents will then use mosquito control techniques as applicable. Activities will be the responsibility of the project proponents, in coordination with applicable MVCDs, and will include, but not be limited to:

- Monitoring for mosquito vector species and population abundance during the high mosquito season (June through September).
- Introducing biological controls, such as mosquito fish, to sedimentation basins, solids lagoons, modified Clifton Court Forebay, and the intermediate forebay inundation area, if mosquitoes are present.
- Introducing physical controls (e.g., discharging dewatered water more frequently or increasing circulation) to sedimentation basins, solids lagoons, modified Clifton Court Forebay, and the intermediate forebay inundation area if mosquitoes are present.

**During Restoration—**To aid in vector management and control, the construction contractors, with project proponents' approval, will be required to develop mosquito management plans and consult

with appropriate MVCDs with respect to restoration and conservation activities within the ROAs. Consultation will occur with the following MVCDs: Alameda County Vector Control Services District, Contra Costa Mosquito and Vector Control District, Sacramento-Yolo Mosquito and Vector Control District, San Joaquin County Mosquito and Vector Control District, and Solano County Mosquito Abatement District. Consultation will include, but may not be limited to, review of the mosquito management plans and BMPs to be implemented at the restoration sites and review of proposed mosquito monitoring efforts at restoration sites and assistance with monitoring efforts where feasible. In addition, the project proponents will consult with the applicable MVCD during all phases of restoration and conservation, including design, implementation, and operations. *The Central Valley Joint Venture's Technical guide to Best Management Practices for Mosquito Control in Managed Wetlands* (Kwasny et al. 2004) and the California Department of Public Health's *Best Management Practices for Mosquito Control in California* (California Department of Public Health 2012), and other guidelines will be used to help design appropriate restoration and conservation features to the extent feasible, consistent with the biological goals and objectives of the proposed project. The mosquito management plans will address wetland design considerations, water management practices, vegetation management, biological controls, and wetland maintenance. BMPs included in the mosquito management plans will include (as applicable), but may not be limited to:

- Delayed or phased fall flooding—phased flooding involves flooding habitat throughout the fall and winter in proportion to wildlife need and takes into consideration other wetland habitat that may be available in surrounding areas.
- Rapid fall flooding.
- Maintain stable water levels.
- Circulate water.
- Use deep initial flooding.
- Subsurface irrigate.
- Utilize water sources with mosquito predators for flooding.
- Drain irrigation water into ditches or other water bodies with abundant mosquito predators.
- Employ vegetation management practices to reduce mosquito production in managed wetlands (e.g., mowing, burning, disking of vegetation that serves as mosquito breeding substrate).
- Design wetlands and operations to be inhospitable to mosquitoes.
- Implement monitoring and sampling programs to detect early signs of mosquito population problems.
- Use biological agents such as mosquito fish to limit larval mosquito populations.
- Use larvicides and adulticides, as necessary. If larvicides and adulticides are required, the project proponent will evaluate the effects of these chemicals and, if required, prepare a monitoring program for review by fish and wildlife agencies to evaluate effects, if any, application would have on macroinvertebrates and associated covered fish and wildlife species.

***Explanation of effectiveness:*** Construction and operation of the water conveyance facilities and restoration and enhancement of aquatic habitat would increase surface water in the Plan Area and potentially provide suitable mosquito breeding habitat, which would increase the public's risk of exposure to vector-borne diseases, which would be a significant impact. These BMPs can effectively



reduce mosquito populations through source reduction, habitat modification, and biological and chemical control (California Department of Public Health 2012). Implementation of these BMPs will reduce the risk of increasing vector-borne diseases in the Plan Area and would therefore reduce this impact to a less-than-significant level.

### 3B.2.16 Conduct Environmental Training

Prior to construction, the project proponents will inform field management and construction personnel of the need to avoid and protect sensitive resources. Training will be conducted during preconstruction meetings so that construction personnel are aware of their responsibilities and the importance of compliance. This commitment is related to *AMM1 Worker Awareness Training*, described in Section 3B.4.1. This training will be provided by qualified resource specialists (e.g., certified biologists, and other specialists.) as specified by individual management plans and/or mitigation plans.

Construction personnel will be educated on the types of sensitive resources located in the Plan Area and the measures required to avoid impacts on these resources. Materials covered in the training program will include environmental rules and regulations for the project construction activities and requirements for limiting activities to approved work areas, timing restrictions, and avoidance of sensitive resource areas.

Training seminars will be held to educate construction supervisors and managers on the following:

- The need for resource avoidance and protection.
- Important timing windows for covered species (i.e. timing of covered fish migration/spawning/rearing, wildlife mating/nesting/fledging, plant flowering periods).
- Provide specific training related to the relevant AMMs that will be implemented during construction for the protection of covered fish, wildlife and plant species, depending upon work to be performed and location of the work (i.e., in-water, upland, wetland).
- Brief discussions of covered species and natural communities of concern.
- Boundaries of the work area.
- Exclusion and construction fencing methods.
- Roles and responsibilities.
- What to do when covered fish, wildlife or plants are encountered (including dead, injured, stressed, or entrapped) in work areas.
- Staking methods to protect resources.
- Environmental commitments.
- Emergency procedures.
- Consequences of violations of the laws and regulations protecting resources.

A fact sheet or other supporting materials containing this information will be prepared and will be distributed to construction supervisors and managers, along with a list of contacts (names, numbers, and affiliations), prior to initiating construction activities. A representative will be appointed by the project proponent to be the primary point of contact for any employee or contractor who might

inadvertently take a covered species, and the representative's name and telephone number provided to the agencies.

If new construction personnel are added to the project, the contractor will ensure that the personnel receive the mandatory training and sign a sheet indicating their attendance and completion of the environmental training before starting work. The training sheets for new construction personnel will be provided to the agencies, if requested.

**Explanation of effectiveness:** By ensuring that all construction personnel undergo preconstruction environmental training regarding environmental rules and regulations applicable to construction activities, requirements for limiting activities to approved work areas, timing restrictions, and avoidance of sensitive aquatic and terrestrial resource areas, the severity of impacts, and particularly direct impacts, on these resources could be avoided and minimized. However, this environmental commitment alone would not be sufficient to reduce all construction-related significant impacts on fish (and related recreational activities) and terrestrial biological resources given that there are multiple impact mechanisms responsible for these impacts, many of which would require not only the implementation of multiple environmental commitments but also the implementation of mitigation measures in order to reduce impacts to a less-than-significant level.

## **3B.2.17 Fugitive Dust Control**

Project proponents will implement basic and enhanced control measures at all construction and staging areas to reduce construction-related fugitive dust. This commitment is related to *AMM35 Fugitive Dust Control*, described in Section 3B.4.35. The following measures are based on the Sacramento Metropolitan Air Quality Management District's CEQA guidelines, and are in conformance with the Bay Area Air Quality Management District, San Joaquin Valley Air Pollution Control District, and Yolo Solano Air Quality Management District fugitive dust control requirements.

### **3B.2.17.1 Basic Fugitive Dust Control Measures**

Project proponents will ensure that the following measures will be implemented to control dust during construction activities.

- Water will be applied to all exposed surfaces as reasonably necessary to prevent visible dust from leaving work areas. Frequency of watering will be increased during especially dry or windy periods or in areas with high construction activity. Exposed surfaces include (but are not limited to) soil piles, graded areas, unpaved parking areas, staging areas, and access roads. If water or other dust control measures cannot be implemented to unpaved access roads, vehicle speeds will be limited to 15 miles per hour on such road segments.
- Cover or maintain at least 2 feet of freeboard space on haul trucks transporting soil, sand, or other loose material on the site. Haul trucks transporting soil, sand, or other loose material that will be traveling along freeways or major roadways shall be covered.
- Use wet power vacuum street sweepers to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.
- Disturbed areas should be promptly finished and/or protected and maintained in a manner to control fugitive dust. Mulch, dust palliative, soil binders, or other reasonable mitigation measures will be used in inactive areas.

### 3B.2.17.2 Enhanced Fugitive Dust Control Measures for Land Disturbance

Project proponents will ensure that the following measures will be implemented to control dust during soil disturbance activities.

- Water exposed soil with adequate frequency for continued moist soil. However, do not overwater to the extent that sediment flows off the site.
- Suspend excavation, grading, and/or demolition activity when wind speeds exceed 20 mph.
- Where appropriate, install wind breaks (e.g., plant trees, solid fencing) on windward side(s) of construction areas.
- Plant vegetative ground cover (native grass/plant seed) in disturbed areas as soon as reasonable after construction is completed. Water appropriately until vegetation is established.

### 3B.2.17.3 Measures for Entrained Road Dust

Project proponents will ensure that the following measures will be implemented to control entrained road dust from unpaved roads, for example dust kicked up from unpaved roadway surfaces.

- Install rattle plates, stabilized construction entrances/exits, wheel washers, or wash off all trucks, vehicles, and equipment leaving the site.
- Treat site accesses to a distance of 100 feet from the paved road with a 6 to 12-inch layer of wood chips, mulch, or gravel to reduce generation of road dust and track out onto public roads.
- Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person will respond and take corrective action within 48 hours. The phone number of the District will also be visible to ensure compliance.

### 3B.2.17.4 Measures for New Concrete Batching Plants

Project proponents will ensure that the following measures will be implemented to control dust during concrete batching activities.

- Apply water and/or chemical suppressants to reduce fugitive dust emissions from active storage piles and during aggregate and sand delivery, storage, and transfer.
- Use a hood system vented to a fabric filter/baghouse to reduce fugitive dust emissions during cement delivery and hopper and central mix loading.

**Explanation of effectiveness:** Implementation of basic and enhanced dust control measures, as well as measures for entrained road dust and concrete batching, would minimize or reduce the severity of air quality and visual impacts related to dust resulting from project land disturbing activities. Given the extent of earthmoving activities that would take place with implementation of the project, it is expected that a substantial amount of dust would be airborne. If *C. immitis* spores are present in this dust, sensitive receptors adjacent to construction areas could be at increased risk of inhaling these spores and developing Valley Fever, which would be a significant impact absent implementation of fugitive dust control. However, dust alone is not the only particulate matter that would cause potentially significant air quality effects (see Chapter 22, *Air Quality and Greenhouse Gases*), and therefore implementation of other environmental commitments (e.g., Construction Equipment Exhaust Reduction Plan), and in some cases, mitigation measures (e.g., Mitigation

Measure AQ-1a and AQ-1b) would be required to reduce the severity of the impact (e.g., Impact AQ-1 and Impact AQ-2) to a less-than-significant level. Similarly, dust would not be the only factor contributing to the potential substantial alteration in existing visual quality or character during construction activities. Other effects such as vegetation removal, changes to topography through grading, and the addition of large-scale industrial structures (intakes and related facilities, would contribute to this impact. Accordingly, mitigation measures would be required to reduce this significant impact on visual resources to less than significant.

### **3B.2.18 Disposal and Reuse of Spoils, Reusable Tunnel Material (RTM), and Dredged Material**

In the course of constructing or operating project facilities, substantial quantities of material are likely to be removed from their existing locations based upon their properties or the need for excavation of particular features. Spoils refer to excavated native soils and are associated with construction of pumping plant facilities and other water conveyance features. Reusable tunnel material (RTM) refers to the mixture of saturated soils and biodegradable soil conditioners or additives that will be generated by tunneling operations and are appropriate for reuse based upon chemical characterization and physical properties. Dredged material refers to sediment removed from the bottom of a body of water for the purposes of in-water construction, or water conveyance, operation (e.g. sediment collected at intake sites), or storage requirements. The quantities of these materials generated by construction or operation of project facilities would vary depending on the alternative selected for implementation. See further discussion in Chapter 3, *Description of Alternatives*, Section 3.6.1. These materials will require handling, storage, and disposal, as well as chemical characterization, prior to any reuse. Temporary storage areas will be designated for these materials. However, to reduce the long-term effects on land use and potentially support implementation of other project elements, the project proponents will develop site-specific plans for the beneficial reuse of these materials, to the greatest extent feasible. This commitment is related to *AMM6 Disposal and Reuse of Spoils, Reusable Tunnel Material, and Dredged Material*; and *AMM10 Restoration of Temporarily Affected Natural Communities*; described in Sections 3B.4.6 and 3B.4.10. A flowchart outlining the process for disposal and reuse of these materials is shown in Figure 3B-1.

#### **3B.2.18.1 Material Storage Site Determination**

Material refers to Spoils, RTM, sediment, and dredged material. These materials will be temporarily stored in designated storage areas. Sediment collected at intake sites will be stored at solids lagoons adjacent to sedimentation basins. Selection of designated storage areas will be based on, but not limited to, the following criteria.

- Material may be placed in project-designated borrow areas.
- Areas for material storage will be located and average of no more than 10 miles from the construction feature
- Areas for material storage will not be located within 100 feet of existing residential or commercial buildings.
- Areas for material storage will not be located within 100 feet of a military facility.
- Material will be located in areas where it will not interfere with existing roads, rail lines, or infrastructure.

- Placement of material in sensitive natural communities and habitat areas, such as surface waters, wetlands, vernal pool complex, alkali seasonal wetland complex or grassland, native grasslands, riparian areas, or crane roost sites, will be avoided or minimized to the extent feasible, consistent with the biological goals and objectives of the project. If placement of material in vernal pool complex or alkali seasonal wetland complex cannot be avoided, material will not be placed within 250 feet of vernal pools or alkali seasonal wetlands (i.e., wetted acres will be avoided by at least 250 feet).
- Landowner concerns and preferences will be considered in designating sites for material storage. DWR will consult directly with landowners to refine the storage area footprint to further minimize impacts to surrounding land uses, including agricultural operations.
- Where feasible, dredged material will be stored on higher elevation land that is set back from surface water bodies a minimum of 150 feet. Upland disposal will help ensure that the material will not be in direct contact with surface water prior to its draining, characterization, and potential treatment.

Additional considerations have been made for the storage of RTM. For example, the proposed locations of the storage areas for RTM have been designed to be close to where the material will be brought to the surface, as well as close to where reuse is expected to occur. In some cases, storage areas are located adjacent to barge landings to facilitate movement to other reuse locations in the Delta.

The area required for material storage is flexible and will depend on several factors.

- The speed with which material is brought to the surface, stored, dried, tested, and moved to reuse locations will be important in determining the final size of storage areas. If material can be dried faster and moved offsite more quickly, less area will be needed at each location.
- The depth to which the material is stacked. Material that is stored in deeper piles will require less area but may dry more slowly, extending the time that is needed.
- The proportion of material at one storage area or another. There will be flexibility during construction to prioritize material storage in some areas as opposed to other areas, based on feasibility of reuse or minimization of impacts.

To preserve this flexibility during construction, the analysis assumes a range of storage area footprints that could be needed across different alternatives (based on different assumptions for the depth of material storage). It is anticipated that less or substantially less of the maximum storage area footprint would actually be required during the construction period. The assumptions used for Alternative 4 represent the maximum storage area that would be needed, which was also evaluated for the BDCP Effects Analysis. To illustrate the potential for smaller RTM storage areas, a range of acreages is provided in relevant impact discussions, accounting for the factors listed above.

### **3B.2.18.2 Material Storage Site Preparation**

A portion of the temporary sites selected for storage of spoils, RTM, and dredged material will be set aside for topsoil storage. The topsoil will be saved for reapplication to disturbed areas post construction. Suitable vegetative material from work site clearing will be chipped, stockpiled, and spread over disturbed soil areas for dust and erosion control purposes where feasible and appropriate and where such material does not contain seeds of nonnative species. Cleared areas will be grubbed as necessary to prepare the areas for grading or other construction activities. Rocks and

other inorganic grubbed materials may be used to backfill borrow areas. The contractor will remove from the work site all debris, rubbish, and other materials not directed to be salvaged and dispose of them in an approved disposal site after obtaining all permits required.

### **3B.2.18.3 Draining, Chemical Characterization, and Treatment**

RTM and associated decant liquid will undergo chemical characterization by the contractor(s) prior to reuse or discharge, respectively, to determine whether it will meet requirements of the National Pollutant Discharge Elimination System (NPDES) and the Central Valley Regional Water Quality Control Board (Central Valley Water Board). Should RTM decant liquid constituents exceed discharge limits, these tunneling byproducts will be treated to comply with NPDES permit requirements. Discharges from RTM draining operations will be conducted in such a way as to not cause erosion at the discharge point. If RTM liquid requires chemical treatment, chemical treatment will ensure that after treatment RTM liquid will be nontoxic to aquatic organisms.

While additives used to facilitate tunneling will be nontoxic and biodegradable, it is possible that some quantity of RTM will be deemed unsuitable for reuse. In such instances, the material will be disposed of at a site approved for disposal of such material. In the case of RTM, such requirements are anticipated to apply to less than 1% of the total volume of excavated material (or, 270,000 cubic yards).

Hazardous materials excavated during construction will be segregated from other construction spoils and properly handled and disposed in accordance with applicable federal, state, and local regulations. Riverine or in-Delta sediment dredging and dredge material disposal activities may involve potential contaminant discharges not addressed through typical NPDES or State Water Board CGP processes. Construction of Dredge Material Disposal (DMD) sites will likely be subject to the State Water Board CGP (Order No. 2009-0009-DWQ). The following list of best management practices (BMPs) is based on information from the various regulatory programs that exist to manage dredging operations, and will be implemented during handling and disposal of any potentially hazardous dredged material.

- The project proponents will ensure the preparation and implementation of a pre-dredge sampling and analysis plan (SAP) to be developed and submitted by the contractor(s) as part of the water plan required pursuant to standard DWR contract specifications Section 01570. Prior to initiating any dredging activity, the SAP will evaluate the presence of contaminants that may impact water quality from the following discharge routes.
  - In-stream discharges during dredging.
  - Direct exposure to contaminants in the material through ingestion, inhalation or dermal exposure.
  - Effluent (return flow) discharge from an upland disposal site.
  - Leachate from upland dredge material disposal that may affect groundwater or surface water.
- Conduct dredging within the allowable in-water “work windows” established by USFWS, NMFS, and CDFW.
- Conduct dredging activities in a manner that will not cause turbidity in the receiving water, as measured in surface waters 300 feet down-current from the construction site, to exceed the

Basin Plan objectives beyond an approved averaging period by the RWQCBs and CDFW. Existing threshold limits in the Basin Plan for turbidity generation are as follows.

- Where natural turbidity is between 0 and 5 NTUs, increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20%.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10%.
- If turbidity generated during dredging exceeds implementation requirements for compliance with the Basin Plan objectives, silt curtains will be utilized to control turbidity. Exceptions to turbidity limits set forth in the Basin Plan may be allowed for dredging operations; in this case, an allowable zone of dilution within which turbidity exceeds the limits will be defined and prescribed in a discharge permit.
- The DMD sites will be designed to contain all of the dredged material and all systems and equipment associated with necessary return flows from the DMD site, including equipment to handle, settle, and/or treat the water prior to return to the receiving water.
- The dredged material disposal site will be designed by a California-licensed professional engineer.
- Two feet of freeboard above the 100-year flood event elevation will be maintained in all dredge material disposal site settling pond(s).
- To the extent feasible dredging equipment will be kept out of riparian areas.
- Dredge spoil will be disposed of outside of riparian areas.

DMD sites will be constructed using appropriate BMPs (such as erosion and sediment control measures [see *Develop and Implement Stormwater Pollution Prevention Plans* for examples]) to prevent discharges of contaminated stormwater to surface waters or groundwater. Some of these BMPs may not be applicable to dredging activities that would occur as part of operation and maintenance of the sedimentation basins and solids lagoons at intake sites.

#### **3B.2.18.4 Material Reuse Plans**

Prior to construction, draining, and chemical characterization of spoil, RTM, and dredged material, the project proponents shall identify sites for reusing such materials to the greatest extent feasible, in connection with project construction activities, habitat restoration and protection activities, as well as potential beneficial uses associated with flood protection and management of groundwater levels within the Plan Area. The project proponents will undertake a thorough investigation to identify sites for the appropriate reuse of material, and, based on the properties of the material and in consultation with the project proponent and other interested parties, the project proponents will identify the specific site for that material. Potential methods of reuse may include, but not be limited to, the following.

- Fill material for construction of embankments or building pads.
- Fill material for levee maintenance.
- Fill material for habitat restoration projects.
- Fill material for roadway projects.

- 1       • Localized subsidence reversal.
- 2       • Material for flood response.
- 3       • Material to fill project -related borrow areas.
- 4       • Other beneficial means of reuse.

5       Material applied to reduce the localized effects of subsidence will be placed on lower elevation lands  
6       and lands adjacent to levees, in order to minimize effects on agricultural practices and improve  
7       levee stability. The material may be left in place and used as stockpile to assist in flood response.  
8       The feasibility of these approaches to reuse will depend upon the suitability of the material for each  
9       purpose based on testing of relevant properties. Site-specific factors such as local demand for  
10       materials and the ability to transport the materials would also be important considerations in  
11       assessing options for reuse. Prior to undertaking the reuse of the materials for these purposes, the  
12       project proponents shall consider whether such reuse may lead to significant or adverse  
13       environmental effects that should be addressed through site-specific environmental documents  
14       prepared under NEPA and/or CEQA.

15       The project proponents will consult relevant parties, such as landowners, reclamation districts,  
16       flood protection agencies, federal and state agencies with jurisdiction in the Delta, and counties, in  
17       developing such site-specific spoil, RTM, and dredged material reuse plans. Where project  
18       proponents determine that it is appropriate that materials be used to prepare land at elevations  
19       suitable for project -related restoration or protection of habitat, the project proponents will  
20       coordinate with the project Implementation Office in developing site-specific plans for transporting  
21       and applying the materials to restoration work sites.

22       Following removal of spoils, RTM, and dredged material from temporary storage sites, stockpiled  
23       topsoil at these areas will be reapplied, and disturbed areas will be returned, to the extent feasible,  
24       to preconstruction conditions, by carefully grading to re-establish surface conditions and elevations  
25       and reconstructing features such as irrigation and drainage facilities. Restoration of the RTM  
26       draining sites will be designed to prevent surface erosion and transport of sediment. Following  
27       these activities, the land will be suitable for returning to agricultural production, under the  
28       discretion of the landowner. Such areas may also be appropriate for the implementation of habitat  
29       restoration or protection in consideration of the proposed project's biological goals and objectives.

30       In some instances, it may be infeasible to transport and reuse spoil, RTM, or dredged materials for  
31       another use due to factors such as the distances and costs involved and/or any environmental  
32       effects associated with transport (e.g., unacceptable traffic concerns or levels of diesel emissions). In  
33       such instances, sites will be evaluated for the potential to reapply topsoil over the spoils, RTM, or  
34       dredged material and to continue or recommence agricultural activities. If, in consultation with  
35       landowners and any other interested parties, project proponents determine that continued use of  
36       the land for agricultural or habitat purposes will be infeasible, the potential for other productive  
37       uses of the land will be examined, including stockpile and staging areas for flood response or the  
38       potential for the site to host solar or wind power generation facilities (if deemed acceptable after  
39       any necessary environmental review). Such instances may require the acquisition of interests in the  
40       land and/or coordination with utilities or other entities; specific arrangements will be made on a  
41       case-by-case basis. Environmental review will be required where necessary under CEQA and/or  
42       NEPA.



**Explanation of effectiveness:** Construction and maintenance of the water conveyance facilities, as well as implementation of other conservation measures related to habitat restoration and enhancement, would result in the production of RTM, spoils, and dredged material at various locations in the Plan Area. Handling, storage and disposal of these materials has the potential to result in significant impacts on water quality, visual resources, recreation, land use, agricultural resources, public services, and terrestrial habitat.

While RTM areas are considered permanent surface impacts for the purposes of impact analysis, it is anticipated that the RTM would be removed from these areas and reused, as appropriate, as bulking material for levee maintenance, as fill material for habitat restoration projects, or other beneficial means of reuse identified for the material. Implementation of this environmental commitment would provide for chemical characterization of RTM, which would ensure that the material will be disposed of at an appropriate disposal site or reused. Appropriate reuse of any spoils, dredged material, and RTM, as would be implemented through the material reuse plan(s), would reduce the need for long-term stockpiling/storage and would therefore reduce the severity of impacts to terrestrial habitat, land use, agriculture, public services, visual and recreation resources. Generally recognized BMPs for managing dredging operations and dredged materials would act as performance standards for minimizing water quality impacts, such as turbidity, that could adversely affect aquatic and recreation resources.

Although implementation of this environmental commitment would potentially substantially reduce the severity of impacts from RTM, spoils and dredged materials on several resources, this environmental commitment alone would not be sufficient to reduce significant impacts to a less-than-significant level. For example, turbidity effects related to construction of the water conveyance facilities would also be reduced through implementation of other environmental commitments (e.g., erosion and sediment control plans and SWPPPs). In addition, for some impacts where this environmental commitment would be relied upon, mitigation measures would still be necessary to reduce a significant impact to less than significant. For example, to address potentially significant alteration in the existing visual quality or character (Impact AES-1 [in part due to spoil/borrow and RTM storage]), several mitigation measures would be implemented (e.g., AES-1a, AES-1b, AES-1d), including Mitigation Measure AES-1c: Develop and Implement a Spoil/Borrow and Reusable Tunnel Material Area Management Plan.

### **Potential Environmental Effects of RTM Use**

It is anticipated that one or more of these disposal and reuse methods could be implemented on any individual spoil, RTM, or dredged material site. Depending on which combination of these approaches is selected, implementation of material reuse plans could create environmental impacts requiring site-specific analysis under CEQA and/or NEPA. Many of these activities would require trucks or barges to gather and haul materials from one section of the Plan Area to another. For instance, reuse of material in the implementation of tidal habitat restoration activities could require material to be transported to locations in the West Delta ROA (including Sherman and Twitchell Islands) or the Cosumnes/Mokelumne ROA (including Glannvale Tract and McCormack-Williamson Tract), among other areas. Locations for reuse in support of levee stability could include areas protected by nonproject levees or where levee problems have been reported in the past, including Staten Island, Bouldin Island, Empire Tract, Webb Tract, Bacon Island, or other places in the Delta. While reuse locations near to the spoil or RTM areas would be preferred, such activity would require use of local roadways, which could lead to short-term effects on traffic, noise levels, and air quality. Similarly, earthwork and grading activities to restore sites to preconstruction conditions

and to apply the materials consistent with their reuse could create noise and effects on air quality during the implementation of reuse plans.

If materials are applied for the purposes of flood protection, flood response, habitat restoration or subsidence reversal, it is possible that existing topsoil could be overcovered and that Important Farmland or farmland with habitat value for one or more covered species could be disturbed temporarily or converted from active agricultural uses. Additionally, materials placed near levees could affect drainage and/or irrigation infrastructure. If material is used for habitat restoration that would have otherwise been implemented as part of the project, reuse of materials could offset the need for fill materials from other sources.

Depending on the selected reuse strategies, however, implementation of spoil, RTM, and dredged material reuse plans could also result in beneficial effects associated with flood protection and response, habitat creation, and depth to groundwater in areas where the ground level is raised.

### **3B.2.18.5 Disposal of RTM, Spoils, and Dredged Material**

A Sampling and Analysis Plan (SAP) will be developed for the disposal of RTM and Dredged Materials. This SAP will be consistent with USACE and USEPA Public Notice 99-4 which provides guidance on SAPs as well as reporting requirements for material test results (USACE and USEPA 1999).

In compliance with Section 13260(a) of the California Water Code, prior to disposal of RTM a Waste Discharge Requirements (WDR) General Order will be issued by the appropriate RWQCB based on submittal of a Report of Waste Discharge (RWD) by DWR (or authorized contractor[s]). The WDR Order will require the Discharger to conduct chemical and physical testing of sediments to be extracted prior to dredging, tunneling, etc. The WDR Order may also require supporting special studies and technical reports. Project operations will be subject to this Order and associated monitoring and reporting program.

For disposal of materials within the San Francisco Bay Regional Water Quality Control Board (San Francisco Bay Water Board) jurisdiction (Region 2), the SAP and results reports will be submitted to the Dredged Material Management Office (DMMO). The DMMO was created to fulfill the cooperative permitting framework goal of the Long Term Management Strategy (LTMS). The DMMO is made up of the participating LTMS agencies (the State Water Board; the San Francisco Bay Water Board; the San Francisco Bay Conservation and Development Commission [BCDC]; USACE, South Pacific Division and San Francisco District; and USEPA, Region 9), the State Lands Commission (SLC), and CDFW and is tasked with reviewing SAPs, test results and permit applications (USACE and USEPA 1999). The DMMO is discussed further under *Permitting* below.

To ensure that sediment accepted at the proposed sites meets state water quality standards, the proposed project will adhere to testing requirements set forth by the DMMO agencies. Sediments must be analyzed for contaminants prior to approval of each dredging project. The San Francisco Bay Water Board staff will review sediment testing data from the project to evaluate its conformity with the dredged material acceptance criteria provided in the WDR General Order which will be adopted for the project by the San Francisco Bay Water Board on a site-specific basis.

Disposal of RTM, Spoils, and Dredge Material within the jurisdiction of the Central Valley Water Board (Region 5) will be subject to the requirements identified by the San Francisco Bay Water Board for evaluation, screening, and disposal as, at this time, the San Francisco Bay Water Board has

developed more comprehensive and detailed guidelines for the beneficial reuse of materials. For the purposes of evaluation in this document the requirements set forth by the San Francisco Bay Water Board will be used as the criteria for disposal in both Region 2 and Region 5. WDR General Orders will be issued by the respective RWQCB, which will determine the final criteria and requirements for RTM, Spoils, and Dredge Material Disposal (DMD).

Sacramento River sediment removed from the water column at the intake sedimentation basins will be reused as described below. However, to the maximum extent feasible, the first and preferred disposition of this material will be to reintroduce it to the water column in order to maintain Delta water quality (specifically, turbidity, as a component of delta smelt critical habitat). DWR will collaborate with USFWS and CDFW to develop and implement a sediment reintroduction plan that provides the desired beneficial habitat effects of maintained turbidity while addressing related permitting concerns (the proposed sediment reintroduction is expected to require permits from the Central Valley Water Board and USACE). USFWS and NMFS will have approval authority for this plan and for monitoring measures, to be specified in the plan, to assess its effectiveness.

### **3B.2.18.5.1 Inland Disposal of Materials**

Inland- disposal of RTM, spoils, and dredge material will be subject to evaluation and testing as described in the *Evaluation of Dredged Material Proposed for Discharge in Waters of the U.S.—Testing Manual* (U.S. Environmental Protection Agency and U.S. Army Corps of Engineers 1998), also referred to as the “Inland Testing Manual” (ITM). The ITM was prepared by the USEPA and the USACE as part of the Long-Term Management Strategy and was developed to establish guidance for conducting testing of dredged materials and to assess the potential for contaminant-related impacts associated with dredged material disposal in open water.

Material disposal within the baseline is regulated under Section 404 of the Clean Water Act (CWA) and is subject to compliance with the CWA Section 404(b)(1) Guidelines. As described by the LTMS Management Plan, July 2001, the baseline includes San Francisco Bay and adjacent waters of the U.S., including wetlands. Sediment Quality Criteria (SQC) have not been developed for the Bay Area that represent a single sediment chemical concentration below which disposal poses minimal risk to the aquatic environment. LTMS agencies implemented a measure in 2001 stating that sediment quality screening guidelines for various beneficial uses will be provided by the San Francisco Bay Water Board’s *Sediment Screening Criteria and Testing Requirement for Wetland Creation and Upland Beneficial Reuse*.

### **3B.2.18.5.2 Wetland/Upland Material Disposal**

Wetland and upland beneficial reuse of RTM, spoils, and dredge material at restoration sites in Region 2 and 5 will be subject to evaluation and testing as required by the San Francisco Bay Water Board Waste Discharge Requirements Order which will be adopted for the project by the San Francisco Bay Water Board and the Central Valley Water Board. The San Francisco Bay Water Board has developed a *Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines* (Draft, May 2000). This document aids in the screening and testing of dredged materials for beneficial reuse and outlines the anticipated requirements; however, permits for beneficial reuse will be site-specific for the reuse sites identified in the RTM plan for the proposed project. For the purposes of the proposed project it is assumed that RTM is subject to the same screening and testing guidelines as dredged materials.

These guidelines contain testing requirements and evaluation of test results for materials which are intended to be used in upland beneficial reuse environments such as habitat/wetland creation, levee maintenance/fill, and construction fill. The screening values which will be used by the San Francisco Bay Water Board and the Central Valley Water Board to evaluate suitability of materials are contained within.

Sediment characterization will follow the protocols specified in the DMMO guidance document, *Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Region* (USACE Public Notice 01-01, or most current version) with the exception that the water column bioassay simulating in-bay unconfined aquatic disposal shall be replaced with the modified effluent elutriate test, as described in Appendix B of the Inland Testing Manual, for both water column toxicity and chemistry (DMMO suite of metals only) and the Water Board May 2000 staff report, *Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines*, or most current revised version. San Francisco Bay Water Board-recommended Sediment Chemistry Screening Guidelines for Beneficial Reuse to Dredged Material are contained in Table 3B-4.

### **3B.2.18.5.3 RTM and Dredge Material Screening**

Sediment dredging sites would undergo initial screening and site evaluation to determine and identify any potential for contamination to be present as hazardous waste. Such screening may include review of site documentation, field reconnaissance surveys, historical aerial imagery, and potential in-water observation and analysis (e.g., visual survey, sediment sampling).

Potential presence of hazardous waste would be evaluated with appropriate sediment sampling and chemical characterization procedures. Confirmed presence of hazardous wastes would trigger the need for further planning and analysis of the extent of contamination, and appropriate removal and disposal at a licensed hazardous waste disposal facility.

### **3B.2.18.5.4 Screening Criteria for Inland Disposal**

Sediment Quality Criteria (SQC) have not been developed for the Bay Area that represent a single sediment chemical concentration below which disposal poses minimal risk to the aquatic environment (LTMS 2001). The LTMS agencies plan to develop a Regional Implementation Manual (RIM) describing testing and analysis requirements for disposal of dredged material in the Bay Area. The RIM will include regional test protocols, contaminants of concern, appropriate species for bioassays, and quality assurance guidance. Sediment quality guidelines, new or modified testing procedures, reference sites, and other testing and suitability-related information will be included as they become available. (LTMS, 2001)

To facilitate and promote beneficial reuse of dredged material, the LTMS agencies implemented the following measure in 2001:

The San Francisco Bay Water Board will revise *Sediment Screening Criteria and Testing Requirements for Wetland Creation and Upland Beneficial Reuse*, which will provide guidelines on testing (including recommendations for reference sites) and sediment quality screening for various beneficial uses. A draft version of the revised document has been issued for public comment and, following the close of the comment period, will be revised and finalized through the formal administrative process (LTMS, 2001).

The San Francisco Bay Water Board's *Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines* (Draft May 2000) is discussed below and provides the guidelines for testing and screening of sediment disposed of for wetland/upland beneficial uses and apply to inland disposal of sediment as well as. These screening guidelines are assumed to be adopted for testing and screening for disposal within the Region 5.

### **3B.2.18.5.5 Screening Criteria**

Sediment characterization will follow the protocols specified in:

- 1) The DMMO guidance document, "*Guidelines for Implementing the Inland Testing Manual in the San Francisco Bay Region*" (USACE Public Notice 01-01, or most current version) with the exception that the water column bioassay simulating in-bay unconfined aquatic disposal shall be replaced with the modified effluent elutriate test, as described in Appendix B of the Inland Testing Manual, for both water column toxicity and chemistry (DMMO suite of metals only); and
- 2) San Francisco Bay Water Board Draft May 2000 staff report, "*Beneficial Reuse of Dredged Materials: Sediment Screening and Testing Guidelines*," or most current revised version.

Surface and foundation material are subject to acceptance criteria derived from the San Francisco Bay Water Board guidelines. The following are anticipated reuse options for RTM and dredge material.

- Fill material for construction of embankments or building pads.
- Fill material for levee maintenance.
- Fill material for habitat restoration projects.
- Fill material for roadway projects.
- Localized subsidence reversal.
- Material for flood response.
- Material to fill project-related borrow areas.
- Other beneficial means of reuse.

The San Francisco Bay Water Board guidelines identify two general classes of dredged material suitable for reuse. Once a potential method or reuse has been identified, dredged material, spoils, and RTM, in the amount necessary to fulfill that reuse method, will be screened to determine if the material meets the wetland surface material screening values or the wetland foundation material screening values which will be contained in the San Francisco Bay Water Board and the Central Valley Water Board Water Quality Certification. Material which does not meet the wetland surface material screening values but does meet the wetland foundation material screening values will likely still be suitable for the upland reuse options listed above. The screening criteria developed for the San Francisco Bay Water Board guidelines were based on statistical estimates of sediment toxicity and ambient concentrations of chemicals found in the sediments of San Francisco Bay (San Francisco Bay Regional Water Quality Control Board 2000).

Wetland surface material is material which is placed in the biotic zone during wetland creation and exhibits bulk sediment concentrations that fall within the range of ambient conditions in the central

portions of San Francisco Bay. The screening guidelines for wetland surface material are the most protective of sensitive potential biological receptors. Wetland surface material is not expected to pose a threat to water quality or the aquatic environment (San Francisco Bay Regional Water Quality Control Board 2000).

Wetland foundation material is material used in wetland creation and restoration projects which is covered by surface material and is not in contact with flora and fauna. These materials generally fall within the range of ambient conditions typically found around the margins of the Bay. This material is not of a quality that constitutes a hazardous or listed waste, but has potential for biological effects and should not come in contact with sensitive potential biological receptors (San Francisco Bay Regional Water Quality Control Board 2000). The screening guidelines below (Table 3B-4) are intended to protect biological receptors from adverse environmental effects during material placement or leachate after placement. Wetland foundation material must be tested to ensure that any water that leaches through the material will not adversely impact the aquatic environment. Final determination of sediment suitability for any specific permit action, however, will be site-specific and will take into consideration placement of foundation materials.

Material which does not meet the criteria for wetland surface material but does meet the criteria for wetland foundation material may be used for upland purposes contingent upon the leaching characteristics and evaluation of direct human contact with the material. Sediment for upland reuse which involves continual human contact will need to be evaluated for constituents whose ambient concentrations are not an issue for sediments in wetlands or water but would exceed the USEPA Region 9 Preliminary Remediation Goals.

**Table 3B-4. Recommended Sediment Chemistry Screening Guidelines for Beneficial Reuse of Dredged Material**

Analyte	Wetland Surface Material		Wetland Foundation Material	
	Concentration	Decision Basis	Concentration	Decision Basis
<b>Metals (mg/kg)</b>				
Arsenic	15.3	Ambient Values	70	ER-M
Cadmium	0.33	Ambient Values	9.6	ER-M
Chromium	112	Ambient Values	370	ER-M
Copper	68.1	Ambient Values	270	ER-M
Lead	43.2	Ambient Values	218	ER-M
Mercury	0.43	Ambient Values	0.7	ER-M
Nickel	112	Ambient Values	120	ER-M
Selenium	0.64	Ambient Values		
Silver	0.58	Ambient Values	3.7	ER-M
Zinc	158	Ambient Values	410	ER-M
<b>Organochlorine Pesticides/PCBS (lg/kg)</b>				
DDTS, sum	7.0	Ambient Values	46.1	ER-M
Chlordanes, sum	2.3	TEL	4.8	PEL
Dieldrin	0.72	TEL	4.3	PEL
Hexachlorocyclohexane, sum	0.78	Ambient Values		
Hexachlorobenzene	0.485	Ambient Values		
PCBs, sum	22.7	ER-L	180	ER-M

Analyte	Wetland Surface Material		Wetland Foundation Material	
	Concentration	Decision Basis	Concentration	Decision Basis
<b>Polycyclic Aromatic Hydrocarbons (lg/kg)</b>				
PAHs, total	3,390	Ambient Values	44,792	ER-M
Low molecular weight PAHs, sum	434	Ambient Values	3,160	ER-M
High molecular weight PAHs, sum	3,060	Ambient Values	9,600	ER-M
1-Methylnaphthalene	12.1	Ambient Values		
1-Methylphenanthrene	31.7	Ambient Values		
2,3,5-Trimethylnaphthalene	9.8	Ambient Values		
2,6-Dimethylnaphthalene	12.1	Ambient Values		
2-Methylnaphthalene	19.4	Ambient Values	670	ER-M
2-Methylphenanthrene		Ambient Values		
3-Methylphenanthrene		Ambient Values		
Acenaphthene	26.0	Ambient Values	500	ER-M
Acenaphthylene	88.0	Ambient Values	640	ER-M
Anthracene	88.0	Ambient Values	1,100	ER-M
Benz(a)anthracene	412	Ambient Values	1,600	ER-M
Benzo(a)pyrene	371	Ambient Values	1,600	ER-M
Benzo(e)pyrene	294	Ambient Values		
Benzo(b)fluoranthene	371	Ambient Values		
Benzo(g,h,i)perylene	310	Ambient Values		
Benzo(k)fluoranthene	258	Ambient Values		
Biphenyl	12.9	Ambient Values		
Chrysene	289	Ambient Values	2,800	ER-M
Dibenz(a,h)anthracene	32.7	Ambient Values	260	ER-M
Fluoranthene	514	Ambient Values	5,100	ER-M
Fluorene	25.3	Ambient Values	540	ER-M
Indeno(1,2,3-c,d)pyrene	382	Ambient Values		
Naphthalene	55.8	Ambient Values	2,100	ER-M
Perylene	145	Ambient Values		
Phenanthrene	237	Ambient Values	1,500	ER-M
Pyrene	665	Ambient Values	2,600	ER-M

Source: San Francisco Bay Regional Water Quality Control Board Guidelines 2000.

### 3B.2.18.5.6 Draining of RTM, Spoils, and Dredge Material Disposal (DMD)

RTM, dredge material, and associated decant liquid from RTM/DMD/wetland restoration sites will undergo chemical characterization by the contractor(s) prior to reuse or discharge, respectively, to determine whether it will meet the site specific NPDES and associated RWQCB requirements. The RWQCB requirements to be met are dependent upon the location determined in the Material Storage Site Determination; this could be the San Francisco Bay Water Board or the Central Valley Water Board.

### 3B.2.18.5.7 NPDES Requirements

Water Quality Based Effluent Limits (WQBELs) will be determined by the appropriate RWQCB on a site-specific basis. Effluent Limits are determined based upon: California Toxics Rule (40 CFR Section 131.38); National Toxics Rule; Primary and Secondary MCLs (USEPA Region 9 MCLs for drinking water standards) and; Basin Plan Site-specific objectives (the San Francisco Bay Water Board and the Central Valley Water Board).

The most stringent criteria will be applied for WQBELs. Monthly average and daily maximum effluent limits will be set by the RWQCB in the NPDES. Water quality objectives are achieved primarily through adoption of water discharge requirements. If required, treatment systems will be developed and implemented to reduce contaminant discharges to ensure compliance with the NPDES permit terms and conditions for the RTM/DMD drainage.

### 3B.2.18.5.8 Sediment and Water Quality Standards

RTM and DM in-water disposal, upland disposal, and wetland restoration activities will be subject to regulatory standards for surface water from direct discharge and DMD dewatering and drainage return flows, and long-term operations-related discharges associated with groundwater leachate, and stormwater runoff. Sediment surfaces will be regulated subject to sediment quality objectives and policies.

Surface Water Quality Criteria/Objectives for the Central Valley Water Board are contained in the *Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin*, Fourth Edition and in the *San Francisco Bay Basin (Region 2) Water Quality Control Plan* for the San Francisco Bay Water Board. These Basin Plans designate beneficial uses, establish water quality objectives, contain implementation plans and policies for protecting waters of the basin, and incorporate by reference, plans and policies adopted by the State Water Board.

The Delta waterways are listed pursuant to CWA Section 303(d) as impaired for chlorpyrifos, DDT, diazinon, Group A pesticides, mercury, unknown toxicity and has recently been listed for pathogens near the Port of Stockton turning basin. A portion of the Delta is listed for electrical conductivity, and low dissolved oxygen causes impairment in the Stockton Deep Water Ship Channel from Channel Point to Disappointment Slough.

The USEPA adopted the *National Toxics Rule* (NTR) on February 5, 1993 and the *California Toxics Rule* (CTR) on May 18, 2000. These rules contain water quality standards applicable to the proposed project. The State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters (SIP), Enclosed Bays, and Estuaries of California* (known as the State Implementation Plan) which contains guidance on implementation of the *National Toxics Rule* and the *California Toxics Rule*. The Basin Plans contain the "Policy for Application of Water Quality Objectives" that requires consideration of published standards of other agencies in implementing narrative water quality objectives. The CTR and NTR standards may be incorporated in waste discharge requirements where appropriate to implement the Basin Plans consistent with the Policy for Application of Water Quality Objectives.

At a minimum, water designated for domestic or municipal supply shall not contain concentrations of chemical constituents in excess of the California maximum contaminant levels (MCLs) specified in the following provisions of Title 22, CCR: Tables 64431-A (Inorganic Chemicals) and 64431-B (Fluoride) of Section 64431, Table 64444-A (Organic Chemicals) of Section 64444, and Table 64449-



A (Secondary Maximum Contaminant Levels-Consumer Acceptance Limits) of Section 64449. The RWQCB may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.

#### **Antidegradation Policy**

State Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintaining High Quality Waters in California") requires that the Regional Board, in regulating the discharge of waste, must maintain high quality waters of the state until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Board's policies (e.g., quality that exceeds water quality objectives).

The discharges authorized by the WDR General Order will be consistent with State Board Resolution 68-16 and 40 CFR 131.12 (the federal antidegradation policy). The WDR General Order will establish requirements that will result in best practicable treatment or control of the discharge to assure that pollution or nuisance will not occur and that the discharges will not unreasonably affect beneficial uses or result in water quality less than prescribed in the Basin Plans. The assimilative capacity of the underlying soil should prevent degradation of groundwater from infiltration of incidental waste constituents. The receiving water and groundwater limits determined in the WDR General Order are intended to ensure that the assimilative capacity will not be exceeded. If the discharge is causing such an increase, then the proposed project may be required to cease the discharge, implement source control, change the method of disposal, or take other action to prevent groundwater or surface water degradation.

#### **Sediment Quality Objectives**

RTM/DMD and wetland restoration activities also will consider the narrative sediment quality objectives of the *Water Quality Control Plan for Enclosed Bays and Estuaries* adopted by the State Water Board in April 2011. Implementation procedures for these objectives are under development.

#### **Permitting**

The following agencies also have jurisdiction over dredging and disposal projects:

1. California Department of Fish and Wildlife
2. National Marine Fisheries Service
3. United States Fish and Wildlife Service
4. United States Army Corps of Engineers
5. State Lands Commission
6. San Francisco Bay Regional Water Quality Control Board or Central Valley Regional Water Quality Control Board (Location Dependent)
7. San Francisco Bay Conservation and Development Commission

#### **Permitting Agencies**

Numerous state and federal agencies regulate dredging and dredged material disposal in the Bay Area. The primary state and federal agencies involved in permitting such projects are the San

Francisco Bay and Sacramento-San Joaquin Delta are the BCDC, SLC, San Francisco Bay Water Board, Central Valley Water Board, USACE, and USEPA. These agencies established the DMMO to coordinate the regulatory processes for dredging and disposal projects. Different laws and regulations govern their roles and responsibilities, but often their purposes and goals overlap (Table 3B-5).

**Table 3B-5. Basis for Regulatory Authority and Mandates of Primary State and Federal Agencies with Jurisdiction over Dredging and Dredged Material Disposal Projects in the San Francisco Bay Region**

USACE	USEPA	BCDC	San Francisco Bay Water Board/ Central Valley Water Board	SLC
<b>Basis for Regulatory Authority</b>				
CWA MPRSA Rivers and Harbors Act of 1899	CWA MPRSA	McAteer-Retris Act Suisun Marsh Protection Act Coastal Zone Management Act	Porter Cologne Water Quality Control Act CWA	Ownership of State Lands
<b>Mandate Includes</b>				
Regulate placement of dredged or fill materials into waters of the U.S. Regulate transportation of dredged material for the purpose of ocean disposal Protect and maintain navigable capacity of nation's waters	Maintain integrity of nation's waters Oversee disposal of materials, including dredged material, into ocean water	Reduce Bay fill Protect and manage coastal zone resources	Protect the beneficial uses of waters of the state	Manage state's sovereign lands for purposes consistent with the public trust.
<b>Regulatory Authority of DMMO Agencies for Dredged Material Disposal Environments</b>				
<b><i>In-Bay</i></b>				
Department of the Army permit pursuant to CWA and Rivers and Harbors Act of 1899	CWA permit oversight	Permit, pursuant to McAteer-Petris Act (MPA) or Suisun Marsh Preservation Act (SMPA), or federal consistency Determination (CD), pursuant to Coastal Zone Management Act (CZMA), for dredging and disposal	CWA Section 401 Water Quality Certification (WQC) or Waste Discharge Requirements (WDRs) pursuant to Porter-Cologne Water Quality Control Act	Permit or lease if disposal on state lands
<b><i>Wetland (existing) enhancement</i></b>				
Department of Army permit pursuant to CWA	CWA permit oversight	Permit, pursuant to MPA or SMPA, or CD, pursuant to CZMA, for dredging, permit or CD for disposal if site within BCDC jurisdiction	CWA Section 401 WQC or WDRs pursuant to Porter-Cologne Water Quality Control Act	Permit or lease if disposal on state lands

USACE	USEPA	BCDC	San Francisco Bay Water Board/ Central Valley Water Board	SLC
<b><i>Restoration of diked historic baylands</i></b>				
Department of the Army permit pursuant to Rivers and Harbors Act of 1899, and to CWA if disposal site in waters of the US	CWA permit oversight if disposal site in waters of the US	Permit, pursuant to MPA or SMPA, or CD, pursuant to CZMA, for dredging, permit or CD for disposal if site within BCDC jurisdiction	CWA Section 401 WQC or WDRs pursuant to Porter-Cologne Water Quality Control Act	Permit or lease if disposal on state lands
<b><i>Upland disposal (other than diked historic baylands, waters of the US)</i></b>				
Advisory, Department of Army permit pursuant to CWA for return flows to waters of US	Advisory, CWA permit oversight	Advisory	CWA Section 401 WQC or WDRs pursuant to Porter-Cologne Water Quality Control Act	Permit or lease if disposal on state lands
<b><i>Landfill</i></b>				
Advisory	Advisory	Advisory	CWA Section 401 WQC or WDRs pursuant to Porter-Cologne Water Quality Control Act	Permit or lease if disposal on state lands

Source: Long Term Management Strategy 2001.

## DMMO

The DMMO does not issue permits; instead, it makes consensus-based recommendations to the member agencies on the adequacy of permit applications. This includes recommendations on the completeness of the permit applications, adequacy of sediment sampling and analysis plans, and suitability of sediments for proposed disposal environments. The member agencies may also recommend permit conditions to be included in individual member agency permits.

In the event a project-related dredging and disposal action does not fall under the jurisdiction of each of the DMMO member agency, it will still be reviewed by the DMMO, but only the agencies with regulatory authority participate in approving sediment sampling plans or making recommendations on sediment suitability. Agencies without regulatory authority will have the opportunity to review the project proposals in an advisory capacity only.

Project are initially reviewed by the DMMO and later move through the permitting processes of the individual agencies. The process for obtaining approvals has three phases: (1) suitability determination; (2) permit process; and (3) episode approval, described below. The DMMO is a comprehensive entry point for the permitting progress; however, applicants and permittees must obtain separate approval from the appropriate DMMO member agencies.

The DMMO member agencies determine suitability of the permit application by making a joint recommendation to the individual member agencies on whether the sediments to be dredged are

appropriate, in terms of potential for environmental impacts, for the proposed disposal or reuse site. The recommendation is usually based on the results of sediment testing (LTMS 2001).

The project proponents will submit to the DMMO either a sediment Sampling and Analysis Plan (SAP), or a written request (with supporting information) requesting a “Tier I” exclusion from testing requirements based on factors such as previous testing history and physical characteristics of the material proposed for dredging.

The CWA Section 404(b)(1) guidelines provide the substantive criteria used by USEPA, USACE, and the San Francisco Bay Water Board in evaluating proposed discharges to waters of the U.S and fundamental to the CWA Section 404(b)(1) guidelines is the guideline that dredged or fill material should not be discharged into the aquatic ecosystem unless it can be demonstrated that such a discharge will not have an unacceptable adverse impact either individually or cumulatively on the ecosystem(s) of concern.

The DMMO will review the SAP to determine consistency with state and federal guidance on testing protocols and to determine whether the proposed testing program would provide the agencies with sufficient information to make a suitability determination of the material for disposal at a specific site. Upon review of a SAP, the DMMO will either approve the SAP, approve the SAP with conditions, or not approve the SAP (LTMS 2001).

Upon approval of the SAP, the project proponents will proceed with testing the sediments proposed for dredging.

The report of these testing results will be submitted to the DMMO for review, at which time the DMMO may recommend one of the following to their respective agencies:

- **Sediments are suitable for the proposed disposal environment**, the applicant may proceed to the next phase (permit process) of authorization.
- **Require further information, such as additional testing of sediments**, to make a recommendation, the applicant may provide the requested information or choose to alter the project in such a way that the agencies can make a determination without additional information.<sup>4</sup>
- **Some or all of the sediments are not suitable for the proposed disposal environment**, the applicant may elect to not undertake or modify the project, such as by proposing another disposal location, and obtain a suitability determination for the modified project (often the suitability determination process can proceed more quickly for a modified project because of the availability of information from the original project proposal). (LTMS 2001).

The project proponents will conduct confirmation sampling of incoming dredged sediment to demonstrate that contaminant concentrations do not exceed the applicable numeric acceptance criteria in the Waste Discharge Permit. Surface grab samples will be collected from each sediment placement cell as it is being filled. The number of samples collected will be consistent with the volume-based frequency employed during the pre-dredge sediment testing program described in the Waste Discharge Permit. Potential minimum sediment sampling guidelines are presented in Table 3B-6.

**Table 3B-6. Minimum Sediment Sampling Guidelines**

Dredge Volume (cubic yards)	Total Number of Samples	Number of Samples per Composite	Total Number of Tests
5,000–20,000	4	4	1
20,000–100,000	8	4	2
100,000–200,000	12	4	3
200,000–300,000	16	4	4
300,000–400,000	20	4	5
400,000–500,000	24	4	6

Source: San Francisco Bay Regional Water Quality Control Board Screening and Testing.

**Permits Required for Dredging and Material Disposal*****National Pollutant Discharge Elimination System***

Any project proposing to discharge pollutants into surface water must file a NPDES permit application form with the appropriate RWQCB. The RWQCB requirements to be met are dependent upon the location determined in the Material Storage Site Determination.

***Water Quality Certification under Section 401 of the CWA***

Under federal CWA Section 401 every applicant for a federal permit or license for any activity which may result in a discharge to a water body must obtain State Water Quality Certification that the proposed activity will comply with state water quality standards. Most Certifications are issued in connection with USACE Section 404 CWA permits for dredge and fill discharges.

***Section 404 CWA***

Section 404 of the CWA establishes a program to regulate the discharge of dredged or fill material into waters of the United States, including wetlands. The proposed project will require a Section 404 permit before dredged or fill material may be discharged into waters of the United States, unless the activity is exempt from Section 404 regulation (e.g. certain farming and forestry activities).

The purpose of the program is to ensure that no discharge of dredged or fill material may be permitted if: (1) a practicable alternative exists that is less damaging to the aquatic environment or (2) the nation's waters would be significantly degraded. During the permit application process, the project proponents will be required to demonstrate that steps were taken to avoid impacts to wetlands, streams and other aquatic resources; that potential impacts were minimized; and that compensation will be provided for all remaining unavoidable impacts (USEPA 2015).

An individual permit will be required for any significant impacts as a result of the proposed project. Individual permits are reviewed by the USACE.

***Section 1602 Streambed Alteration Agreement***

A CDFW Section 1602 Streambed Alteration Agreement will be required for disposal of RTM, spoils, and Dredged Material. This permit governs proposed project activities that will modify the physical characteristics of the stream and activities that may affect fish and wildlife resource that use the

stream and surrounding habitat. The proposed project will require a Master Agreement; this is an agreement for a duration longer than 5 years that is similar to a programmatic agreement.

### ***Potential State Lands Permit or Lease***

A Permit or Lease may be required for dredging on State land from the SLC. For work in harbors and waterways, dredging permits are issued by the Commission.

### ***Suisun Marsh Preservation Act Permit***

The BCDC issues marsh development permits for any activity that qualifies as a marsh development within the primary management area of the Suisun Marsh. A project permit will be required for any new or maintenance dredging or for the disposal of dredged material within the BCDC's jurisdiction.

### ***Section 10 Permit***

The proposed project will require a UUSACE Section 10 permit (Rivers & Harbors Act) for dredging operations within waterways of the United States and may require a CWA Section 404 permit for the discharge of the "effluent" to surface waters. Each project requires a NPDES permit as well as a CWA Section 401 Water Quality Certification from the Regional Board. Such Certification will be issued; in conjunction with each approved "Notice of Applicability". The federal permits must be obtained prior to discharge.

### ***Waste Discharge Requirements***

Projects proposing to use wetland foundation material are expected to require Waste Discharge Permits from the San Francisco Bay Water Board and the Central Valley Water Board to ensure that there will be minimal risk of adverse impacts. The appropriate RWQCB will review the proposed project, then may grant or deny certification. Additionally, the RWQCB may choose to act under the authority of the state Porter Cologne Water Quality Control Act. The RWCB would do this by issuing waste discharge requirements for the project in combination with the water quality certification.

Water quality certifications and waste discharge requirements often contain conditions to protect water resources. The proposed project will meet these conditions during the term of the permit. BCDC also regulates dredging and disposal under the provisions of the McAteer-Petris Act. The RWQCB will implement these measures through its issuance of Waste Discharge Requirements and Water Quality Certifications under Section 401 of the CWA or other orders. In addition, the Water Board may require pre- and post-dredge surveys to determine disposal volumes and compliance with permit conditions.

Projects eligible for enrollment under the WDR General Order may also be subject to regulation by CDFW, NMFS, the USFWS, and SLC.

### ***Reusable Tunnel Material Testing Report Results***

Testing of RTM was conducted on samples collected during geotechnical investigations from 2009 through 2012. Environmental tests were conducted on identified baseline and conditioned soil samples. The results of the geotechnical, environmental, and planting suitability tests, RTM appears to be suitable for the above proposed beneficial uses following storage and drying. Consultation with the governing regulatory agency would be required to obtain the necessary approvals and permits. This study consisted of a limited number of samples and tests, and does not constitute a complete evaluation of RTM. RTM and associated decant liquid will undergo chemical characterization by the

contractor(s) prior to reuse or discharge, respectively. The results of these tests can be found in the Reusable Tunnel Material Testing Report (URS 2014).

### Mitigation

Mitigation measures for placement of RTM and Dredged Material is captured in the Mitigation Monitoring and Reporting Plan.

## 3B.2.19 Provide Notification of Maintenance Activities in Waterways

Before maintenance activities begin in waterways, project proponents will ensure the posting of information regarding the maintenance of any in-water project facilities (e.g., intakes for the water conveyance facility) at nearby affected Delta marinas and public launch ramps. This information will include maintenance site location(s), maintenance schedules, speed limits, and identification of no-wake zone and/or detours, where applicable. Information on detours would include site-specific details regarding any temporary partial channel closures, including contacting the U.S. Coast Guard, boating organizations, marina operators, city or county parks departments, and California Department of Parks and Recreation (DPR), where applicable. This commitment is related to *AMM36 Notification of Activities in Waterways*, described in Section 3B.4.36.

**Explanation of effectiveness:** Implementation of this environmental commitment would minimize the following: reduction in water-based recreation opportunities; changes in community character; effects on recreational economics as a result of maintenance of the water conveyance facilities; and changes in community character as a result of implementing habitat restoration activities. Because the impact of reducing water-based recreation opportunities would not be long-term, it would not be considered significant even in the absence of this environmental commitment.

## 3B.2.20 Selenium Management

The activities described in this environmental commitment require a series of actions to identify and evaluate potentially feasible actions to minimize conditions that promote bioaccumulation of selenium in restored areas. This commitment is related to *AMM27 Selenium Management*, described in Section 3B.4.27.

This environmental commitment would include project proponents performing the following actions.

- Before ground-breaking activities associated with site-specific restoration occurs, project proponents will retain a qualified water quality specialist, wildlife, or fisheries biologist with expertise in selenium management to develop a comprehensive Selenium Monitoring and Management Plan (SMMP). The SMMP will evaluate site-specific restoration conditions and include design elements that minimize conditions that could be conducive to increases of bioavailable selenium in restored areas. As part of the SMMP, the qualified specialist will assess whether, in light of site-specific conditions, the proposed restoration project could cause potentially significant increases in bioavailable selenium due to increased residence time for water-borne selenium within inundated portions of the restoration area. If any such potentially significant effects are identified, the SMMP shall include a Mitigation Plan that includes components that will reduce levels of bioavailable selenium such that the affected water body

(or portion of a water body) would not be expected to cause measurably higher body burdens in aquatic organisms, thus reducing those effects to less-than-significant levels. The design elements would be integrated into site-specific restoration designs based on site conditions, community type (tidal marsh, nontidal marsh, floodplain), and potential organic forms of selenium in water. Specific approaches that are intended to avoid or minimize potential increases in selenium bioavailability at future restoration sites could include the following:

- Minimizing bioavailable selenium concentrations associated with anoxic or near-anoxic conditions by reducing the amount of organic material at a restoration site (however, where this measure could limit the benefit of restoration areas by limiting the amount of carbon they supply to the Delta as a whole, it would run directly counter to the goals and objectives of the project, so it should not be implemented in such a way that it reduces the benefits to the Delta ecosystem provided by restoration areas), and
- Managing vegetation, water levels and residence time to reduce bioavailable selenium concentrations and bioaccumulation, as feasible.
- Define adaptive management strategies that can be implemented to monitor and minimize, as feasible, actual post-restoration bioavailable selenium concentrations in the water, and if necessary, bioaccumulation of selenium. The adaptive management strategies could be applied where site conditions indicate a high probability of selenium bioaccumulation and effects on covered species.
- For each restoration project under *CM4 Tidal Natural Communities Restoration* or Environmental Commitment 4 Tidal Natural Communities Restoration, a project-specific SMMP would be developed and would incorporate all of the management measures discussed below or include an explanation of why a particular measure cannot be incorporated. The plan would include the following components:
  - A brief review of predicted changes in water residence time at assessment locations in the Delta, expected changes in bioavailable selenium concentrations, and possible changes in bioaccumulation by fish and aquatic invertebrates.
  - A determination if sampling for characterization of selenium concentrations in biota and/or post-restoration monitoring is warranted.
  - A plan for conducting the sampling for selenium, if characterization sampling is recommended. To cover any sampling or monitoring, the project-specific SMMP would also include a quality assurance/quality control program specifying sampling procedures, analytical methods, data review requirements, and data management and reporting procedures.
  - Statistical analyses of selenium water concentrations and fish tissue levels collected over time to evaluate trends in these parameters.

This environmental commitment provides specific tidal habitat restoration design elements to reduce the potential for bioaccumulation of selenium and its bioavailability in tidal habitats. Consequently, this commitment would be implemented as part of the tidal habitat restoration design schedule.

***Explanation of effectiveness:*** While increases in bioavailable selenium in the habitat restoration areas are uncertain, this environmental commitment, along with other proposed avoidance and minimization measures, would require evaluating risks of selenium exposure at a project level for



each restoration area, minimizing to the extent practicable potential risk of additional bioaccumulation, and monitoring selenium levels in fish and/or wildlife to establish whether, or to what extent, additional bioaccumulation is occurring. Although it is unlikely that substantial increases in selenium in fish tissues or bird eggs would occur such that effects on aquatic life beneficial uses would be anticipated, in the absence of this environmental commitment, increases in selenium could result in significant impacts. This environmental commitment reduces those impacts to a less than significant level.

Selenium toxicity in avian species can result from the mobilization of naturally high concentrations of selenium in soils (Ohlendorf and Heinz 2009) and covered activities have the potential to exacerbate bioaccumulation of selenium in avian species, such as California black rail, California clapper rail, California least tern, Greater and Lesser sandhill crane, least bittern and white-faced biis. Marsh (tidal and nontidal) and floodplain restoration have the potential to mobilize selenium, and therefore increase avian exposure from ingestion of prey items with elevated selenium levels. Thus, project-related restoration activities that create newly inundated areas could increase bioavailability of selenium. Changes in selenium concentrations were analyzed in Chapter 8, *Water Quality*, and it was determined that, relative to Existing Conditions and the No Action Alternative, construction and operation of the water conveyance facilities would not result in substantial, long-term increases in selenium concentrations in water in the Delta under any alternative. However, it is difficult to determine whether the effects of potential increases in selenium bioavailability associated with restoration-related conservation actions would lead to adverse effects on California black rail.

Because of the uncertainty that exists at this programmatic level of review, there could be a substantial effect on avian species and habitat from increases in selenium associated with restoration activities. This effect would be addressed through the implementation of this environmental commitment, along with *AMM27 Selenium Management*, which would provide specific tidal habitat restoration design elements to reduce the potential for bioaccumulation of selenium and its bioavailability in tidal habitats (see Section 3B.4.27). Furthermore, the effectiveness of selenium management to reduce selenium concentrations and/or bioaccumulation would be evaluated separately for each restoration effort as part of design and implementation.

Longer water residence times in restoration areas could also make selenium more bioavailable to Sacramento splittail but Delta-relevant information is limited to assess this risk. It is anticipated that any potential effects of selenium on Sacramento splittail would be addressed through implementation of this environmental commitment and AMM27.

In the absence of this environmental commitment, CMs and AMMs, increases in selenium could lead to significant impacts.

### **3B.2.21 CEQA and NEPA Compliance for BDCP-related Conservation Projects**

Prior to implementing project-related habitat restoration conservation projects as described generally in the ROAs<sup>19</sup> for all alternatives except 2A, 4A, and 5D, project proponents commit to undertaking additional analysis pursuant to CEQA and NEPA. The Final EIR/EIS provides project-

<sup>19</sup> For additional information on the ROAs please see Chapter 3 of the BDCP and Final EIR/EIS Appendix 3G, *Background on the Process of Developing the BDCP Conservation Measures*.

level analysis of Alternatives 2A, 4A, and 5D, which, therefore, are anticipated to go forward without additional formal environmental review. In determining the extent to which they may rely on programmatic analysis in the EIR/EIS in assessing project-specific impacts on terrestrial biological resources and the extent to which additional new site-specific information regarding potential impacts on such resources is needed, the project proponents will compare the areas that will be directly and indirectly affected by proposed conservation projects with the theoretical footprints for conservation projects assumed in the programmatic analyses for effects on terrestrial biological resources found in the EIR/EIS. Such a comparison shall identify the extent, if any, to which the impacts of proposed conservation projects may extend onto lands that were not considered in the EIR/EIS because they were outside these theoretical impact areas. The proponents for project-related conservation projects further commit to considering any potential impacts on any natural communities, special-status wildlife and plant species, and common species that may occur on the lands affected by such conservation projects but that were not discussed in the EIR/EIS. A checklist intended to guide the preparation of future CEQA and NEPA compliance documents for project-related projects other than CM1 is described in detail in Appendix 31A, *BDCP Later CM Activity Environmental Checklist*.

**Explanation of effectiveness:** The BDCP alternatives in the Final EIR/EIS are addressed through a combination of project-level and program-level review, with proposed conveyance facilities and their associated operations being addressed at a project level, while the large-scale, long-term habitat restoration and preservation components were necessarily addressed at a program level.

The checklist in Appendix 31A is a tool for determining whether such programmatic coverage is sufficient to provide for full compliance with CEQA and/or NEPA with respect to individual “later activities” carrying out the BDCP, including CM2–CM21 or components thereof. This checklist has been designed to ensure that, in undertaking such analyses, the Lead Agencies will make all relevant inquiries, including whether a later activity has been formulated in a manner that complies with all applicable mitigation requirements, including those found in any relevant Conservation Measure (CM) from the BDCP, “Avoidance and Minimization Measures” (AMMs) in the BDCP, any “environmental commitments” (ECs) made by the Lead Agencies in proposing the BDCP, and any mitigation measures adopted at the time of approval of the BDCP.

The lead agencies must evaluate each proposed “later activity” associated with other CMs pursuant to the relevant provisions of NEPA and CEQA (and their implementing regulations) to determine whether the later activity has been adequately examined in the BDCP EIR/EIS. Such an evaluation shall ascertain whether “a later activity would have effects that were not examined in the program [EIR/EIS].” If the answer is in the negative (i.e., the later activity would *not* have any effects not previously examined), then the Lead Agencies would conclude that the later activity “is within the scope of the project covered by the program EIR, and no new environmental document would be required.” (CEQA Guidelines, § 15168, subds. (c)(2), (c)(2).) On the other hand, if the later CM activity would result in an effect that was not adequately examined in the BDCP EIR/EIS (i.e., the later activity is *not* within the scope of the program EIR/EIS), then additional environmental analysis by the appropriate lead agencies will be undertaken to determine the appropriate CEQA/NEPA documentation. Depending on the severity of the new effect(s), an addendum, a Categorical Exemption, a Negative Declaration, Mitigated Negative Declaration, or an EIR must be prepared for CEQA purposes, and a Categorical Exclusion, Finding of No Significant Effect (FONSI) or EIS would be required under NEPA.

### 3B.2.22 Comply with Caltrans' Division of Aeronautics on Location of Conveyance Facilities Within 2 Miles of Airport Boundary

If the proposed sites of project conveyance facilities are within 2 miles, measured by air line, of that point on an airport runway, or runway proposed by an airport master plan, which is nearest the site, DWR shall, before acquiring title to property for construction of the facilities or for an addition to a present site, notify the Caltrans' Division of Aeronautics prior to initiating construction of the project conveyance facilities, in writing, of the proposed acquisition. DWR shall investigate the proposed site and, within 30 working days after receipt of the notice, shall submit to DWR a written Obstruction Evaluation/Airport Airspace Analysis (OE/AAA) of the investigation and its recommendations concerning acquisition of the site. DWR would comply with Caltrans' recommendations based on its investigations and compliance with the recommendations of the OE/AAA.

**Explanation of effectiveness:** High-profile construction equipment, such as tall cranes for installation of pipelines, placement of concrete fill in intake piles, and removal of cofferdam sheet piles, for example, and pile drivers, such as would be used during the construction of the intakes, have the potential to result in safety hazards to aircraft during takeoff and landing if the equipment is operated too close to runways. Tower cranes, for example, may be required, and a typical tower crane can have a total height greater than 200 feet—a height that could be considered an obstruction or hazard to navigable air space if located near an airport. Similarly, tall structures, such as the surge towers at the pumping plants for Intakes 1 and 2, could also pose a risk to air safety.

Coordination with Caltrans' Division of Aeronautics prior to initiating construction and compliance with its recommendations based on its investigations, which could include limitations necessary to minimize potential problems, such as the use of temporary construction equipment, supplemental notice requirements, and marking and lighting high-profile structures would reduce the potential for impacts on air safety.

### 3B.2.23 Use of Slurry Cutoff Walls to Protect Groundwater during Dewatering Operations

Groundwater conditions are generally within 5 to 10 feet of the ground surface near the intake locations, the Intermediate Forebay, tunnel shafts, and Clifton Court/Byron Tract Forebay. The bottom elevation (or invert) of the intake structures, tunnel shafts, and forebays will be below the groundwater elevation prior to construction. Depending on the construction methods to be used, the groundwater will need to be removed from the construction area prior to or after excavation. DWR shall use methods to remove the groundwater in a manner that would protect groundwater elevations and quality in adjacent properties. These methods will include use of slurry cutoff walls at the construction sites, as summarized below.

- Intakes: Deep slurry cutoff walls at the intakes will be installed to reduce or avoid levee under-seepage in accordance with USACE requirements and to reduce the groundwater inflow into deep excavations within the intake construction sites. The deep slurry cutoff walls will be installed around the structures to minimize the need for dewatering and the related effects on groundwater conditions near the construction locations. The structures at the intake locations to be constructed below the ground surface will be constructed using impermeable structural

material (e.g., concrete). Along the Sacramento River, cutoff walls will be extended into the levees in accordance with USACE requirements and a sheet pile cofferdam will be constructed prior to dewatering and excavation of the site.

- Tunnel Shafts: Slurry diaphragm walls will be installed prior to construction of the tunnel shafts to minimize the need for dewatering. The tunnel shafts and the bottom of the tunnel shafts will be constructed of impermeable material to prevent groundwater from entering the tunnel shafts.
- Forebays: Deep slurry cutoff walls at the forebays will be installed to reduce or avoid levee under-seepage in accordance with Division of Safety of Dams requirements for water storage facilities. The deep slurry cutoff walls around the forebays will minimize the need to for dewatering and the related effects on groundwater conditions near the construction locations. At Clifton Court Forebay, new embankments around the construction site will include installation of a sheet pile cofferdam prior to dewatering and excavation of the site.

Construction of slurry cutoff walls along the water bodies at the intake locations and the forebays will extend to the levees where the slurry cutoff wall will connect to a diaphragm wall installed along the levee. The diaphragm wall will serve as a structural wall for the intake. The slurry cutoff wall also will be constructed along the backside of the intake structure sites. This slurry cutoff wall will be tied into the proposed slurry cutoff wall that parallels the river or sloughs. In this arrangement, the entire construction area within the slurry cutoff wall perimeter can be dewatered without impacting surrounding groundwater levels.

The slurry cutoff wall will extend to a depth below the invert elevation of the excavation to allow for removal of groundwater below the excavation and formation of a structurally-sound foundation for the intake, levee, or other structures. The depths of the slurry cutoff wall will be dependent upon the local geology and could change even at the same intake location or along the forebay levee. The design objective will be to extend the slurry cutoff wall to a clay layer that would be allow the wall to form a relatively good seal that would force the groundwater to move around or under the slurry cutoff walls.

During design geotechnical borings will be completed to develop specific design parameters for slurry cutoff walls and seepage control methods at each location. It is anticipated that the design parameters will not only be different for each site, but will change along the extent of the slurry cutoff wall at each site. The geotechnical information will be used to identify groundwater flow and recharge rates, groundwater dewatering rates, horizontal extents of the zone of influence, and depths of potential groundwater elevation changes that could occur if the slurry cutoff walls were not installed.

***Explanation of effectiveness:*** The construction of conveyance features could result in an adverse effect on groundwater levels and associated well yields. Construction of the conveyance facilities would require dewatering operations. Dewatering would temporarily lower groundwater levels in the vicinity of the dewatering sites. Groundwater would return to pre-pumping levels over the course of several months. Simulation results suggest that 2 months after pumping ceases, water levels would recover to within 5 feet of pre-pumping water levels. The sustainable yield of some wells might temporarily be affected by the lowering of water levels such that they are not able to support existing land uses.

Installation of slurry cutoff walls at the intake locations, tunnel shafts and forebays would reduce dewatering effects on surrounding wells during construction.

## 3B.2.24 Use of Slurry Cutoff Walls and Toe Drains to Minimize Seepage from Forebays

The forebays will be constructed with slurry cutoff walls around the embankments. These walls will avoid or minimize water from flowing through the embankments in accordance with the DWR Division of Safety of Dams requirements. The impermeable or low-permeability slurry cutoff walls will extend to an impermeable soil layer. The impermeable layers could be discontinuous around the perimeter of the forebays. In those areas, the potential for groundwater flow at depths under the embankments will be minimized through the placement of grout along the bottom of the slurry cutoff walls.

The material along the bottom of the forebays could range from impermeable to low-permeability soils. When the surface water elevations in the forebays rise towards the maximum design surface water elevation, the weight of the water has the potential to result in groundwater flow through the embankments. French drains and/or interceptor wells will be installed on the land-side of the forebay levees and implementation of a groundwater monitoring program to reduce the potential for seepage onto adjacent properties.

**Explanation of effectiveness:** The operation of conveyance features is anticipated to affect groundwater levels in the vicinity of the two new forebays: the Intermediate Forebay and the Byron Tract Forebay adjacent to the east side of Clifton Court. In the absence of design features intended to minimize seepage, groundwater levels are projected to rise by up to 10 feet in the vicinity of the Intermediate and Byron Tract Forebays due to groundwater recharge from these surface water impoundments. Were they to occur, these groundwater-level increases could potentially result in groundwater levels encroaching on the ground surface in the vicinity of the new forebays, and potentially result in effects on agricultural operations in the vicinity.

Installation of a seepage cutoff wall installed to the impervious layer and a toe drain around the forebay embankment, to capture water and pump it back into the forebay would reduce minimize seepage under the embankments.

## 3B.3 Other Commitments

The following commitments are identified separately from environmental commitments for the purpose of addressing other nonenvironmental consequences of implementing the project. As with environmental commitments, these other commitments are incorporated into the project and would be implemented in the same or similar manner as proposed mitigation measures. These additional commitments are actions that the project proponents commit to implementing in some manner to reduce or partially reduce potential effects related to the environmental impacts disclosed in this EIR/EIS and caused by implementation of the project, even if the underlying environmental impact is not fully reduced or remains unchanged.

### 3B.3.1 Assist Water Purveyors in Developing Methods to Reduce Potential Water Quality Effects

The project proponents commit to assisting in-Delta municipal, industrial, and agricultural water purveyors that will be subject to significant unavoidable water quality effects from operation of the

water conveyance facilities and effects on dissolved organic carbon (DOC) due to habitat restoration activities. This commitment shall apply specifically to those purveyors affected by significant unavoidable increases in bromide, electrical conductivity, chloride, and DOC concentrations such that the purveyors will bear increased financial costs in order to continue to treat or otherwise supply water to acceptable standards. The assistance provided by the project proponents is intended to fully offset any increased treatment or delivery costs attributable to the water conveyance facilities, or for DOC attributable to habitat restoration activities and may take the form of financial contributions, technical contributions, or partnerships. Assistance for construction and/or operation of facilities or the procurement of replacement sources shall be limited to reasonable, cost-effective solutions developed with input from the project proponents. It is anticipated that such solutions would be devised by the affected purveyors in consultation with project proponents after thorough investigation and the completion of environmental review. The methods used for this investigation and monitoring, along with the conclusions regarding the nature and extent of those effects on water treatment or delivery, would be subject to agreement between the project proponents and the affected water purveyors.

Assistance shall not extend to investments needed solely or substantially to address adverse water quality effects due to any of the following: sea level rise and/or changed precipitation patterns attributable to climate change; the regulatory actions of other agencies or programs within or upstream of the Delta that may affect water quality; or effects not otherwise associated with operations of the water conveyance facilities. This commitment would supplement, rather than supersede, the commitments set forth in Mitigation Measures WQ-5, WQ-7, WQ-11, and WQ-18 (presented in Chapter 8, *Water Quality*). This commitment will arise only upon the approval of the project. Potential alternative solutions for further consideration are described below.

### 3B.3.1.1 Chloride and Electrical Conductivity

The following are concepts that affected purveyors could consider to address any significant unavoidable effects of increased chloride concentrations and electrical conductivity:

**Provide Funding Assistance to Acquire Alternative in-Basin Water Supplies, Storage, Conjunctive Uses, or Develop Water Transfers (municipal uses).** Additional water supply improvement projects or agreements could be developed to facilitate improved blending water quality to reduce chloride. This concept could be applied to potential Los Vaqueros Reservoir effects based on investigations recommend in Mitigation Measure WQ-7 (Chapter 8, *Water Quality*).

**Develop Water Supply Connections to SWP Facilities or BDCP Intertie (municipal uses).** Water supply supplement/replacement actions or agreements could be developed to provide an alternative water supply during poor Delta water quality periods.

**Develop demand management and/or conservation/recycling projects to extend available water supplies (municipal uses).** Facilitation and development of additional demand management, water conservation, and wastewater recycling projects would help reduce use of Delta diversion facilities when water quality is poor allowing for more efficient use of other existing water supplies.

**Assist with alternative crop or water management efficiency projects/facilities (agricultural uses).** Assistance could be provided to develop additional irrigation efficiency projects or facilities to reduce in-Delta diversions and facilitate improved Delta drainage quality.

**Provide alternative intake locations (agricultural uses).** Assistance could be provided to identify and evaluate feasible projects to provide alternative agricultural intakes that may improve diverted water quality and/or reduce adverse effects to Delta water quality.

### 3B.3.1.2 Bromide

The following are concepts that could be considered to address any significant unavoidable effects of increased bromide concentrations:

**Provide Funding Assistance to Acquire Alternative in-Basin Water Supplies, Groundwater Banking, or Conjunctive Uses.** Additional water supply improvement projects or agreements could be developed to facilitate reduced use of the North Bay Aqueduct (NBA) and improved water supply blending quality, to reduce potential formation of disinfection byproducts (DBP).

**Develop DOC source control projects for Barker Slough/Cache Slough watersheds.** Agricultural and/or other waste control projects could be developed to reduce effects of watershed runoff on DOC levels at the NBA intake pump station. DOC reduction would reduce DBP formation potential.

**Develop demand management and/or conservation/recycling projects to extend available water supplies.** Facilitation and development of additional demand management, water conservation, and wastewater recycling projects would help reduce use of NBA at critical dry periods when Barker Slough/Delta water quality is poor, allowing more efficient use of available water supplies.

**Expand existing NBA intake capacity.** The existing NBA pipeline conveyance capacity could be expanded to approximately 250 cubic feet per second (from the existing capacity of 145 cubic feet per second) to facilitate increased diversion efficiency and quantity during favorable water quality periods. NBA expansion could be complementary to other conjunctive use or storage options.

**Implement the North Bay Aqueduct Alternative Intake Project.** The North Bay Aqueduct Alternative Intake Project could be implemented to establish an alternative surface water intake on the Sacramento River upstream of the Sacramento Regional Wastewater Treatment Plant discharge.

### 3B.3.1.3 Dissolved Organic Carbon

The following are concepts that could be considered to address any significant unavoidable effects of increased DOC concentrations:

**Provide funding to implement treatment for DOC and/or DBPs in water treatment facilities.** This could include pre-treatment of DOC or modification of disinfection facilities to minimize DBP formation, or post-disinfection treatment for DBPs or modifications to distribution systems to limit DBP formation.

**Develop DOC source control projects.** Agricultural and/or other waste control projects could be developed to reduce effects of watershed runoff on DOC levels. DOC reduction would reduce DBP formation potential.

### 3B.3.2 Enhance Recreation Access in the Vicinity of the Proposed Intakes

Prior to construction activities in the area of the intakes, DWR shall enhance the visual character of the area by creating new wildlife viewing sites and enhancing interest in the construction site by constructing viewing areas and displaying information about the project, which may attract people who may use the recreation facilities to the construction site as part of the visit.

To further compensate for the loss of access as a result of constructing the river intakes, DWR shall work with DPR to help insure the elements of the water conveyance facilities would not conflict with the elements proposed in DPR's *Recreation Proposal for the Sacramento-San Joaquin Delta and Suisun Marsh* (California Department of Parks and Recreation 2011) that would enhance bicycle and foot access to the Delta. This would include the helping to fund or construct elements of the American Discovery Trail and the potential conversion of the abandoned Southern Pacific Railroad rail line that formerly connected Sacramento to Walnut Grove. DWR will ensure that the constructed elements of the water conveyance facilities would not result in physical barriers to implementing the Delta recreation access elements outlined in the DPR proposal. DWR will also work with DPR to determine if some of the constructed elements of the water conveyance facilities could incorporate elements of the DPR's proposal.

### 3B.3.3 Fund Efforts to carry out the Recommendations Adopted in the Delta Plan

To further compensate for impacts to the environment that could arise from the location and construction of the proposed water conveyance facilities and implementation of Environmental Commitments and in anticipation of future consultation with the Delta Stewardship Council related to Delta Reform Act compliance, the Lead Agencies, in consultation with DSC, DPR, DBW, DPC, and CDFW, shall prepare a Recreation Opportunity Study. The recreation study will 1) evaluate the effectiveness of mitigation measures (REC-2, BIO-75, AES-1a, AES-1b, AES-1c, AES-1d, AES-1e, AES-1f, AES-1g, AES-4a, AES-4b, AES-4c, AES-4d, TRANS-1a, TRANS-1b, TRANS-1c, NOI-1a, and NOI-1b) at reducing impacts to the environment and if necessary, 2) identify and fund appropriate recommendations outlined below:

- Contribute funds for the construction of new recreation opportunities as well as for the protection of existing recreation opportunities as outlined in Recommendation DP R11 of the Delta Plan.
- Assist in funding the expansion of public recreation areas in the Delta as described in Recommendation DP R13 of the Delta Plan.
- Consult with CDFW to expand wildlife viewing, angling, and hunting opportunities, as described in Recommendation DP R14 of the Delta Plan.

Potential areas for use of funds include, but are not limited to; improvements at Delta Meadows-Locke Boarding House; potential new parks at Barker Slough, Elkhorn Basin, and/or the Wright-Elmwood Tract, or in the south Delta; creation of boating trails in the Delta waterways, and enhancement of recreational opportunities in and around the Yolo Bypass Wildlife Area.



The study will be conducted prior to commencement of construction and implementation of the project mitigation measures and will include visitor counts during construction. The study will include, but are not limited to, analysis of the following as needed and appropriate after consultation with the entities listed above:

- Assess impacts to recreational vehicle parks, hotels and motels.
- Assess what portion of a typical 65-minute recreational drive from Freeport to Antioch along Highway 160 would be impaired by construction detours, aesthetic impacts, and traffic congestion along the route.
- Assess the length of waterways affected by construction.
- Assess affected facilities' annual visitation levels or recreational capacity (e.g., number of berths or overnight spaces)

This commitment serves to further compensate for impacts to the environment within the project area.

### **3B.3.4 Fund the California Department of Boating and Waterways' Programs for Aquatic Weed Control**

Invasive aquatic vegetation can limit access to boats and reduce swimming areas. Project proponents will contribute funds to further the DBW's aquatic weed control programs in the Delta. Enhanced ability to control invasive vegetation would lead to increased recreation opportunities which would compensate for the loss of recreational opportunities within the project area by providing a recreational opportunity downstream/upstream in the same area for the same regional recreational users. The funds will be transferred prior to, or concurrent with, commencement of construction of the project.

This commitment would supplement *CM13 Invasive Aquatic Vegetation Control*, which also provides for the control of *egeria*, water hyacinth, and other IAV throughout the Plan Area. The project Implementation Office would partner with existing programs operating in the Delta (including DBW, U.S. Department of Agriculture-Agriculture Research Service, University of California Cooperative Extension Weed Research and Information Center, California Department of Food and Agriculture, local Weed Management Areas, Resource Conservation Districts, and the California Invasive Plant Council) to perform risk assessment and subsequent prioritization of treatment areas to strategically and effectively reduce expansion of the multiple species of IAV in the Delta. This risk assessment would dictate where initial control efforts would occur to maximize the effectiveness of the conservation measure. The proposed project's contribution to DBW's aquatic weed control would include enhancement funding for those areas with project impacts that are located outside DBW's risk assessment area.

### **3B.3.5 Provide Construction Site Security**

To ensure adequate construction site security, the project proponents will arrange to provide for 24-hour onsite security personnel. Security personnel will monitor and patrol construction sites, including staging and equipment storage areas. Security personnel will monitor construction sites for potential criminal activities and nuisances at construction sites. Private patrol security operators hired to provide site security will have the appropriate licenses from the California Bureau of

Security and Investigative Services. Individual security personnel will have a minimum security guard registration license that meets the California Bureau of Security and Investigative Services requirements for training and continuation training as required for that license. All security personnel will also receive environmental training similar to that of onsite construction workers so that they understand the environmental conditions and issues associated with the various areas for which they are responsible at a given time. This commitment is related to *AMM34 Construction Site Security*, described in Section 3B.4.34.

Security operations and field personnel will be given the emergency contact phone numbers of environmental response personnel for rapid response to environmental issues resulting from vandalism or incidents that occur when construction personnel are not onsite. Security operations will also maintain a contact list of backup support from city police, county sheriffs, California Highway Patrol, water patrols (such as the Contra Costa County Marine Patrol), helicopter response, and emergency response (including fire departments, ambulances/emergency medical technicians)]. The appropriate local and regional contact list will be made available to security personnel by project proponents. When on patrol, security personnel will be required to have the ability to contact backup or response by having cell phones or two way radios.

***Explanation of effectiveness:*** Given the scale and duration of construction required for the water conveyance facilities and other conservation measures requiring construction, there could be an increased demand on law enforcement due to theft and vandalism in major construction sites after work hours. By having 24-hour onsite security at these sites, this demand would be reduced or avoided. An increase in public service demands due to implementation of the project would be a significant impact. However, because potential theft and vandalism of equipment and property would not be the only project-related effects that could result in this potential increase in demand for public services, other environmental commitments related to reducing the potential for fire hazards, hazardous spills, and other hazards would be implemented in order to reduce this impact to a less-than-significant level.

### **3B.3.6            Develop North Delta Intake Operations Protocols to Reduce Reverse Flow Effects at Regional San Outfall**

Modeling shows that operation of Alternative 4A may increase the frequency of reverse flows in the lower Sacramento River at Freeport, relative to the No Action Alternative, based on certain low flow conditions and flood tides. These increased reverse flow events at Freeport have the potential to cause the Sacramento Regional County Sanitation District (Regional San) to limit discharges from its Sacramento Regional Wastewater Treatment Plant to the Sacramento River and hold treated effluent in its storage basins until downstream river flow resumes and thus river discharge can resume.

Under this commitment, in consideration of tides and river flows, DWR, in consultation with Regional San, will develop a rule curve and/or operating protocols for the North Delta Intake diversions that will account for peak flow periods within the tidal fluctuations of the Sacramento River to ensure that Regional San operations will remain consistent with facility storage capabilities and thus not adversely impact Sacramento Regional Wastewater Treatment Plant operations.

## 3B.4 Avoidance and Minimization Measures

Avoidance and minimization measures have been incorporated into the analysis throughout the EIR/EIS as a means of avoiding or reducing impacts of the proposed project. All AMMs would apply to all alternatives, except that *AMM26 Salt Marsh Harvest Mouse and Suisun Shrew* and *AMM37 Recreation* would not apply to the non-HCP alternatives, including the proposed project, because there would be no activity in salt marsh harvest mouse or Suisun shrew habitat under non-HCP alternatives. Those listed below have been identified as avoiding or reducing effects to a less-than-significant level.

**Table 3B-7. Summary of Avoidance and Minimization Measures Used As Mitigation**

Number	Title	Summary
<b>Benefit All Natural Communities and Covered Species</b>		
AMM1	Worker Awareness Training	Includes procedures and training requirements to educate construction personnel on the types of sensitive resources in the project area, the applicable environmental rules and regulations, and the measures required to avoid and minimize effects on these resources.
AMM2	Construction Best Management Practices and Monitoring	Standard practices and measures that will be implemented prior, during, and after construction to avoid or minimize effects of construction activities on sensitive resources (e.g., species, habitat), and monitoring protocols for verifying the protection provided by the implemented measures.
<b>Primarily Benefit Covered Fishes</b>		
AMM3	Stormwater Pollution Prevention Plan	Includes measures that will be implemented to minimize pollutants in stormwater discharges during and after construction related to covered activities, and that will be incorporated into a stormwater pollution prevention plan to prevent water quality degradation related to pollutant delivery from project area runoff to receiving waters.
AMM4	Erosion and Sediment Control Plan	Includes measures that will be implemented for ground-disturbing activities to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities, and that will be incorporated into plans developed and implemented as part of the National Pollutant Discharge Elimination System permitting process for covered activities.
AMM5	Spill Prevention, Containment, and Countermeasure Plan	Includes measures to prevent and respond to spills of hazardous material that could affect navigable waters, including actions used to prevent spills, as well as specifying actions that will be taken should any spills occur, and emergency notification procedures.
AMM6	Disposal and Reuse of Spoils, Reusable Tunnel Material, and Dredged Material	Includes measures for handling, storage, beneficial reuse, and disposal of excavation or dredge spoils and reusable tunnel material, including procedures for the chemical characterization of this material or the decant water to comply with permit requirements, and reducing potential effects on aquatic habitat, as well as specific measures to avoid and minimize effects on species in the areas where reusable tunnel material would be used or disposed.
AMM7	Barge Operations Plan	Includes measures to avoid or minimize effects on aquatic species and habitat related to barge operations, by establishing specific protocols for the operation of all project-related vessels at the construction and/or barge landing sites. Also includes monitoring protocols to verify compliance with the plan and procedures for contingency plans.

Number	Title	Summary
<b>Primarily Benefit Covered Plants, Wildlife, or Natural Communities</b>		
AMM10	Restoration of Temporarily Affected Natural Communities	Restore and monitor natural communities in the Plan Area that are temporarily affected by covered activities. Measures will be incorporated into restoration and monitoring plans and will include methods for stockpiling and storing topsoil, restoring soil conditions, and revegetating disturbed areas; schedules for monitoring and maintenance; strategies for adaptive management; reporting requirements; and success criteria.
AMM11	Covered Plant Species	Requires rare plant surveys of project sites with suitable habitat for special-status plants. Includes measures to avoid and minimize effects on populations of rare plants.
AMM12	Vernal Pool Crustaceans	Includes provisions to require project design to minimize indirect effects on modeled habitat, avoid effects on core recovery areas, minimize ground-disturbing activities or alterations to hydrology, conduct protocol-level surveys if activities take place in core recovery areas, and redesign projects to ensure that no suitable habitat within these areas.
AMM13	California Tiger Salamander	During the project planning phase, identify suitable habitat within 1.3 miles of the project footprint, ash survey aquatic habitats in potential work areas for California tiger salamander. If California tiger salamander larvae or eggs are found, implement prescribed mitigation.
AMM14	California Red-Legged Frog	During the project planning phase, identify suitable habitat within 1 mile of the project footprint, conduct a preconstruction survey, implement protective measures for areas where species presence is known or assumed, and establish appropriate buffer distances. If aquatic habitat cannot be avoided, implement prescribed surveys and mitigation.
AMM15	Valley Elderberry Longhorn Beetle	During the project planning phase, conduct surveys for elderberry shrubs within 100 feet of covered activities involving ground disturbance, and design project to avoid effects within 100 feet of shrubs, if feasible. Implement additional protective measures, as stipulated in AMM2. Elderberry shrubs identified within project footprints that cannot be avoided will be transplanted to previously approved conservation areas in the Plan Area.
AMM18	Swainson's Hawk	Conduct preconstruction surveys of potentially occupied breeding habitat in and within 0.25 mile of the project footprint to locate active nest sites.
AMM19	California Clapper Rail	Identify suitable habitat in and within 500 feet of the project footprint. Perform surveys and implement prescribed protective measures in areas where species is present or assumed to be present.
AMM20	Greater Sandhill Crane	Conduct preconstruction surveys to determine winter roost occupancy within 0.75 mile of the construction area boundary and determine related areas of foraging and roosting habitat. Implement protective measures in occupied areas.
AMM21	Tricolored Blackbird	Conduct preconstruction surveys in breeding habitat within 1,300 feet of the project footprint, if the project is to occur during the breeding season. Avoid any construction activity within 250 feet of an active tricolored blackbird nesting colony, and minimize such activity within 1,300 feet.
AMM22	Suisun Song Sparrow, Yellow-Breasted Chat, Least Bell's Vireo, Western Yellow-Billed Cuckoo	Conduct preconstruction surveys of potential breeding habitat in and within 500 feet of project activities. It may be necessary to conduct the breeding bird surveys during the preceding year depending on when construction is scheduled to start. Implement protective measures in occupied areas.

Number	Title	Summary
AMM23	Western Burrowing Owl	Perform surveys where burrowing owl habitat (or sign) is encountered within 500 feet of a proposed construction area. If burrowing owls or suitable burrowing owl burrows are identified during the habitat survey, and if the project does not fully avoid direct and indirect impacts on the suitable habitat, perform preconstruction surveys and implement certain minimization measures.
AMM24	San Joaquin Kit Fox	Conduct habitat assessment in and within 250 feet of project footprint. If suitable habitat is present, conduct a preconstruction survey and implement U.S. Fish and Wildlife Service guidelines. Implement protective measures in occupied areas.
AMM25	Riparian Woodrat and Riparian Brush Rabbit	Conduct surveys for projects occurring within suitable habitat as identified from habitat modeling and by additional assessments conducted during the planning phase of construction or restoration projects following U.S. Fish and Wildlife Service <i>Draft Habitat Assessment Guidelines and Survey Protocol for the Riparian Brush Rabbit and the Riparian Woodrat</i> . Implement protective measures in suitable habitat.
AMM26	Salt Marsh Harvest Mouse and Suisun Shrew	Identify suitable habitat in and within 100 feet of the project footprint for projects in the species range. Ground disturbance will be limited to the period between May 1 and November 30, to avoid destroying nests with young. Prior to ground-disturbing activities, vegetation will first be removed with nonmechanized hand tools (e.g., goat or sheep grazing, or in limited cases where the biological monitor can confirm that there is no risk of harming salt marsh harvest mouse or Suisun shrew, hoes, rakes, and shovels may be used). Implement protective measures in suitable habitat.
AMM27	Selenium Management	Develop a plan to evaluate site-specific restoration conditions and include design elements that minimize any conditions that could be conducive to increases of bioavailable selenium in restored areas. Before ground-breaking activities associated with site-specific restoration occurs, identify and evaluate potentially feasible actions for the purpose of minimizing conditions that promote bioaccumulation of selenium in restored areas.
AMM28	Geotechnical Studies	Conduct geotechnical investigations to identify the types of soil avoidance or soil stabilization measures that should be implemented to ensure that the facilities are constructed to withstand subsidence and settlement and to conform to applicable state and federal standards.
AMM29	Design Standards and Building Codes	Ensure that the standards, guidelines, and codes, which establish minimum design criteria and construction requirements for project facilities, will be followed. Follow any other standards, guidelines, and code requirements that are promulgated during the detailed design and construction phases and during operation of the conveyance facilities.
AMM30	Transmission Line Design and Alignment Guidelines	Design the alignment of proposed transmission lines to minimize impacts on sensitive terrestrial and aquatic habitats when siting poles and towers. Restore disturbed areas to preconstruction conditions. In agricultural areas, implement additional BMPs. Site transmission lines to avoid greater sandhill crane roost sites or, for temporary roost sites, by relocating roost sites prior to construction if needed. Site transmission lines to minimize bird strike risk.
AMM31	Noise Abatement	Develop and implement a plan to avoid or reduce the potential in-air noise impacts related to construction, maintenance, and operations.

Number	Title	Summary
AMM32	Hazardous Material Management	Develop and implement site-specific plans that will provide detailed information on the types of hazardous materials used or stored at all sites associated with the water conveyance facilities and required emergency-response procedures in case of a spill. Before construction activities begin, establish a specific protocol for the proper handling and disposal of hazardous materials.
AMM33	Mosquito Management	Consult with appropriate mosquito and vector control districts before the sedimentation basins, solids lagoons, and the intermediate forebay inundation area become operational. Once these components are operational, consult again with the control districts to determine if mosquitoes are present in these facilities, and implement mosquito control techniques as applicable. Consult with the control districts when designing and planning restoration sites.
AMM34	Construction Site Security	Provide all security personnel with environmental training similar to that of onsite construction workers, so that they understand the environmental conditions and issues associated with the various areas for which they are responsible at a given time.
AMM35	Fugitive Dust Control	Implement basic and enhanced control measures at all construction and staging areas to reduce construction-related fugitive dust and ensure the project commitments are appropriately implemented before and during construction, and that proper documentation procedures are followed.
AMM37	Recreation	Implement avoidance and minimization measures for recreational use within the reserve system. Measures to be implemented address the siting, designing, and construction of trails and other recreational facilities. Allowable recreational uses will be controlled using a variety of techniques including fences, gates, clearly signed trails, educational kiosks, trail maps and brochures, interpretive programs, patrol by land management staff, and restrictions by area and time.
AMM 38	California Black Rail	Preconstruction surveys for California black rail will be conducted where potentially suitable habitat for this species occurs within 500 feet of work areas. If California black rail is present in the immediate construction area, protective measures will apply during construction activities.
AMM 39	White Tailed Kite	Conduct preconstruction surveys of potentially occupied breeding habitat in and within 0.25 mile of the project footprint to locate active nest sites.

### 3B.4.1 AMM1 Worker Awareness Training

The Implementation Office (under BDCP) or DWR (under California WaterFix) will provide training to field management and construction personnel on the importance of protecting sensitive natural resources (i.e., special-status fish species, wildlife species, plant species, and designated critical and/or suitable habitats for these species). Training will be conducted during preconstruction meetings so that construction personnel are aware of their responsibilities and the importance of compliance. All trainees will be required to sign a sheet indicating their attendance and completion of environmental training. The training sheets will be provided to the fish and wildlife agencies if requested. These requirements also pertain to operations and maintenance personnel working in and adjacent to special-status species habitat and natural communities.

Construction personnel will be educated on the types of sensitive resources located in the project area and the measures required to avoid and minimize effects on these resources. Materials covered

in the training program will include environmental rules and regulations for the specific project and requirements for limiting activities to approved work areas, timing restrictions, and avoidance of sensitive resource areas. In general, trainings will include the following components.

- Important timing windows for special-status species (i.e., timing of special-status fish migration, spawning, and rearing; wildlife mating, nesting, and fledging; and plant flowering periods).
- Specific training related to the relevant AMMs that will be implemented during construction for the protection of special-status fish, wildlife, and plant species and natural communities important for the special-status species (i.e., AMM2 through AMM39).
- The legal requirements for resource avoidance and protection.
- Identification of relevant special-status fish, wildlife, and plant species, depending upon work to be performed and location of the work (e.g., in-water, upland, wetland).
- Protocol for identifying the proper AMMs to implement for the protection of special-status fish, wildlife and plants based upon the nature, timing, and location of construction activities to be performed.
- Brief discussions of special-status species and natural communities of concern.
- Boundaries of the work area.
- Avoidance and minimization commitments.
- Exclusion and construction fencing methods.
- Roles and responsibilities.
- What to do when special-status fish, wildlife, or plant species are encountered (dead, injured, stressed or entrapped) in work areas.
- Penalties for noncompliance.

A fact sheet or other supporting materials containing this information will be prepared and will be distributed along with a list of contacts (names, numbers, and affiliations) prior to initiating construction activities. A representative will be appointed by the project proponent to be the primary point of contact for any employee or contractor who might inadvertently take a special-status species, or a representative will be identified during the employee education program and the representative's name and telephone number provided to the fish and wildlife agencies.

If new construction personnel are added to the project, the contractor will ensure that the personnel receive the mandatory training and sign a sheet indicating their attendance and completion of the environmental training before starting work. The training sheets for new construction personnel will be provided to the fish and wildlife agencies, if requested.

***Explanation of effectiveness:*** The implementation of worker awareness training would help avoid and minimize effects on biological resources during water conveyance facilities construction, restoration activities, and operations and maintenance. When construction staff members are well-trained, they serve as additional pairs of eyes to spot special-status species that may appear in the work area, they learn to identify and avoid certain sensitive natural communities, and they fully understand their responsibilities both under the law and for achieving project success (e.g., avoiding project shut downs for noncompliance with environmental laws and regulations).

In absence of the implementation of this avoidance and minimization measure, other AMMs, and habitat restoration activities, there would be a greater potential for significant impacts on special-status species and natural communities due to loss of habitat and loss of species from construction and operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### **3B.4.2 AMM2: Construction Best Management Practices and Monitoring**

DWR will ensure that all construction and operation and maintenance activities in and adjacent to sensitive resources areas (e.g., fish, wildlife, and plant species habitats, and natural communities), implement BMPs and have construction monitored by qualified technical specialists. Depending on the resource of concern and construction timing, construction activities and areas will be monitored for compliance with water quality regulations (SWPPP monitoring) and with AMMs developed for sensitive biological resources (biological monitoring).

Before implementing an approved project, DWR will prepare a construction monitoring plan for the protection of fish, wildlife, and plant species. The plan will include the following elements.

- Reference to or inclusion of the SWPPP prepared under the CGP, where one is needed (AMM3).
- Summaries or copies of planning and preconstruction surveys (if applicable) for natural communities and special-status species.
- Description of AMMs to be implemented, including a description of project-specific BMPs or additional measures not otherwise included in the project.
- Descriptions of monitoring parameters (e.g., turbidity), including the specific activities to be monitored (e.g., dredging, grading activities) and monitoring frequency and duration (e.g., once per hour during all in-water construction activities), as well as parameters and reporting criteria (e.g., Turbidity is not to exceed 10 NTU above background. Exceedances will be reported to the Environmental Manager and the construction superintendent must identify and correct the cause.).
- Description of roles and responsibilities of the monitors and protocols for notifying the Environmental Manager and Construction Manager of concerns.
- A monitoring log prepared by the construction monitor, which documents the day's construction activities, notes any problems identified and solutions implemented to rectify those problems, and notifications to the construction superintendent and/or the fish and wildlife agencies regarding any exceedances of specific parameters (i.e., turbidity) or observations of special-status species.

The following measures will be implemented prior to and during construction activities or other project related activities for the protection of special-status fish, wildlife and plant species, their designated critical habitat, and natural communities. Additional measures may be developed for site-specific conditions or specific special-status species during the review and preconstruction planning of individual projects.

- All in-water construction activities will be conducted during the allowable in-water work windows established by USFWS, NMFS, and CDFW for the protection of special-status fish species.



- 1 • Qualified biologists will monitor construction activities in areas identified during the planning

2 stages and species/habitat surveys as having special-status fish, wildlife, and plant species, their

3 designated critical habitat, and other sensitive natural communities. The intent of the biological

4 monitoring is to ensure that specific AMMs that have been integrated into the project design and

5 permit requirements are being implemented correctly during construction and are working

6 appropriately and as intended for the protection of special-status species, natural communities,

7 and the environment in general.
- 8 • Biological monitors will be professional biologists selected for their knowledge of the special-

9 status species and natural communities that may be affected by construction activities. The

10 qualifications of the biologist(s) will be presented to the fish and wildlife agencies for review

11 and written approval prior to initiating construction. If a special status species is observed in an

12 active work area, the biological monitors shall immediately provide the Construction Manager

13 with its location and recommendation on how to handle the special status species. The

14 Construction Manager shall work with the contractor and biological monitor to take steps

15 necessary to ensure the protection of the species consistent with permits and authorizations.
- 16 • During construction, the nondisturbance buffers described under the special-status species'

17 AMMs, below, will be established and maintained as necessary. A qualified biologist will monitor

18 the site consistent with the requirements described for special-status species to ensure that

19 buffers are enforced and sensitive resources are not disturbed.
- 20 • Exclusionary fencing will be placed at the edge of active construction activities and staging areas

21 (after having been cleared by biological surveys) to restrict wildlife access from the adjacent

22 habitats. The need for exclusionary fencing will be determined during the preconstruction

23 surveys and construction planning phase and may vary depending on the species and habitats

24 present. Exclusion fencing will be maintained such that it is intact during rain events. Fencing

25 will be checked daily by the construction inspector or environmental monitors. Damaged

26 fencing will be repaired promptly to reduce the risk of access by sensitive species. Active

27 construction and staging areas will be delineated with high-visibility temporary fencing at least

28 4 feet in height, flagging, or other barrier to prevent encroachment of construction personnel

29 and equipment outside the defined project footprint. Such fencing will be inspected and

30 maintained daily by the construction foreman until completion of the project. The fencing will

31 be removed from areas only after all construction activities are completed and equipment is

32 removed. No project-related construction activities will occur outside the delineated project

33 construction areas.
- 34 • Project-related vehicles will observe a speed limit of 20 miles per hour in construction areas,

35 except on county roads and state and federal highways. A vehicle speed limit of 20 miles per

36 hour will be posted and enforced on all nonpublic access roads, particularly on rainy nights

37 when California tiger salamanders and California red-legged frogs are most likely to be moving

38 between breeding and upland habitats. Extra caution will be used on cool days when giant

39 garter snakes may be basking on roads.
- 40 • All ingress/egress at the project site will be restricted to those routes identified in the project

41 plans and description. Cross-country access routes will be clearly marked in the field with

42 appropriate flagging and signs.
- 43 • All vehicle parking will be restricted to established areas, existing roads, or other suitable areas.

- 1 • To avoid attracting predators, all food-related trash items such as wrappers, cans, bottles, and  
2 food scraps will be disposed of in enclosed containers and trash will be removed and disposed of  
3 at an appropriate facility at least once a week from the construction or project site. All contracts  
4 with contractors will include language reminding them of the obligations to abide by all laws  
5 related to litter. These obligations will be applicable both within work areas and while traveling  
6 along public roads within the Plan Area. Vehicles carrying trash will be required to have loads  
7 covered and secured to prevent trash and debris from falling onto roads and adjacent  
8 properties.
- 9 • To avoid injury or death to wildlife, no firearms will be allowed on the project site except for  
10 those carried by authorized security personnel or local, state, or federal law enforcement  
11 officials.
- 12 • To prevent harassment, injury, or mortality of sensitive wildlife by dogs or cats, no canine or  
13 feline pets will be permitted in the active construction area.
- 14 • To prevent inadvertent entrapment of special status wildlife during construction, in areas that  
15 may be occupied by special status wildlife at risk for entrapment, all excavated, steep-walled  
16 holes or trenches more than 1 foot deep will be covered at the close of each working day with  
17 plywood or similar material, and/or provided with one or more escape ramps constructed of  
18 earth fill or wooden planks. Before such holes or trenches are filled, they will be thoroughly  
19 inspected for trapped animals. If a special-status species is encountered during construction  
20 work, to the extent feasible, construction activities should be diverted away from the animal  
21 until it can be moved by a USFWS- or CDFW-approved biologist.
- 22 • Capture and relocation of trapped or injured wildlife can only be performed by personnel with  
23 appropriate USFWS and CDFW handling permits. Any sightings and any incidental take will be  
24 reported to CDFW and USFWS via email within 1 working day of the discovery. A follow-up  
25 report will be sent to these agencies, including dates, locations, habitat description, and any  
26 corrective measures taken to protect special-status species encountered. For each special-status  
27 species encountered, the biologist will submit a completed CNDDDB field survey form (or  
28 equivalent) to CDFW no more than 90 days after completing the last field visit to the project site.
- 29 • Plastic monofilament netting or similar material will not be used for erosion control, because  
30 smaller wildlife may become entangled or trapped in it. Acceptable substitutes include coconut  
31 coir matting or tackified hydroseeding compounds. This limitation will be communicated to the  
32 contractor through specifications or special provisions included in the construction bid  
33 solicitation package.
- 34 • Special-status wildlife can be attracted to den-like structures such as pipes and may enter stored  
35 pipes and become trapped or injured. All construction pipes, culverts, or similar features;  
36 construction equipment; or construction debris left overnight in areas that may be occupied by  
37 special status species that could occupy such structures will be inspected by the biological  
38 monitor prior to being used for construction. Such inspections will occur at the beginning of  
39 each day's activities, for those materials to be used or moved that day. If necessary, and under  
40 the direct supervision of the biologist, the structure may be moved up to one time to isolate it  
41 from construction activities, until the special-status species has moved from the structure of  
42 their own volition, been captured and relocated, or otherwise been removed from the structure.
- 43 • Rodenticides and herbicides will be used in accordance with the manufacturer recommended  
44 uses and applications and in such a manner as to prevent primary or secondary poisoning of

special-status fish, wildlife, and plant species and depletion of prey populations upon which they depend. All uses of such compounds will observe label and other restrictions mandated by USEPA, the California Department of Pesticide Regulation, and other appropriate state and federal regulations, as well as additional project-related restrictions imposed by USFWS, NMFS and/or CDFW. If rodent control must be conducted in San Joaquin kit fox habitat, zinc phosphide should be used because of its proven lower risk to kit fox. In addition, the method of rodent control will comply with those discussed in the 4(d) rule published in the final listing rule for tiger salamander (69 Federal Register [FR] 47211–47248). The rodent control restrictions described above will be implemented *in perpetuity*.

- Nets or bare hands may be used to capture and handle special-status fish or wildlife species. A professional biologist will be responsible for and direct any efforts to capture and handle special-status species. Any person who captures and handles special-status species will not use soaps, oils, creams, lotions, insect repellents, solvents or other potentially harmful chemicals of any sort on their hands within 2 hours before handling special-status fish or wildlife. Latex gloves will not be used either. To avoid transferring diseases or pathogens between aquatic habitats during the course of surveys or the capture and handling of special-status fish or wildlife species, all species captured and handled will be released in a safe, aquatic environment as close to the point of capture as possible, and not transported and released to a different water body. When capturing and handling special-status amphibians, the biologists will follow the Declining Amphibian Population Task Force's *Fieldwork Code of Practice* (U.S. Fish and Wildlife Service no date [a]). While in captivity, individual amphibians will be kept in a cool, moist, aerated environment such as a dark (i.e., green or brown) bucket containing a damp sponge. Containers used for holding or transporting these species will be sanitized and will not contain any standing water.
- CDFW, NMFS and/or USFWS will be notified within 1 working day of the discovery of, injury to, or mortality of a special-status species that results from project-related construction activities or is observed at the project site. Notification will include the date, time, and location of the incident or of the discovery of an individual special-status species that is dead or injured. For a special-status species that is injured, general information on the type or extent of injury will be included. The location of the incident will be clearly indicated on a U.S. Geological Survey 7.5-minute quadrangle and/or similar map at a scale that will allow others to find the location in the field, or as requested by CDFW, NMFS and/or USFWS. The biologist is encouraged to include any other pertinent information in the notification.
- Habitat subject to permanent and temporary construction disturbances and other types of ongoing project-related disturbance activities will be minimized by adhering to the following activities. Project designs will limit or cluster permanent project features to the smallest area possible while still permitting achievement of project goals. To minimize temporary disturbances, all project-related vehicle traffic material storage will be restricted to established and/or designated ingress/egress points, construction areas, and other designated staging/storage areas. These areas will also be included in preconstruction surveys and, to the extent possible, will be established in locations disturbed by previous activities to prevent further effects.
- Spoils, RTM, and dredged material will be disposed of at an approved site or facility in accordance with all applicable federal, state, and local regulations.

- Upon completion of the project, all habitat subject to temporary ground disturbances, including storage and staging areas, temporary roads, pipeline corridors, will be recontoured to preproject elevations, as appropriate and necessary, and revegetated to promote restoration of the area to pre-project conditions. An area subject to “temporary” disturbance is any area that is disturbed to allow for construction of the project, but is not required for operation or maintenance of any project-related infrastructure, will not be subject to further disturbance after project completion by DWR, and has the potential to be revegetated. Appropriate methods and native plant species used to revegetate such areas will be determined on a site-specific basis in consultation with USFWS, NMFS, and/or CDFW, and biologists (AMM10).

**Explanation of effectiveness:** The development of a construction monitoring plan and the use monitors will ensure that all measures to protect sensitive biological resources and water quality identified in other AMMs and mitigation measures are effectively and efficiently implemented. The best management practices listed in AMM2 provide specific guidance to ensure that, during construction, operations, and maintenance, the take of species and degradation of habitat is avoided and minimized to the extent practicable. These measures help avoid and minimize behavioral changes, injury, and mortality of fish and wildlife, help maintain the integrity of water quality in the Delta and adjacent freshwater habitats, and avoid and minimize effects on adjacent terrestrial habitats.

In absence of the implementation of AMM2, CMs, mitigation measures, and other AMMs, there would be a greater potential for impacts on these species and natural communities due to degradation of habitat and potential injury or mortality of species from construction and/or operations and maintenance of the proposed project. Refer to the impact analyses for each resource for more detail.

### 3B.4.3 AMM3 Stormwater Pollution Prevention Plan

DWR commits to implementing measures, as described below, as part of the construction activities and in advance of any necessary permit(s). In accordance with these environmental commitments, DWR will ensure the preparation and implementation of SWPPPs to control short-term and long-term effects associated with construction-generated stormwater runoff. It is anticipated that multiple SWPPPs will be prepared for construction activities, each taking into account site-specific conditions (e.g., proximity to surface water, drainage). The SWPPPs will include all the necessary state requirements regarding construction-generated stormwater collection, detention, treatment, and discharge that will be in place throughout the construction period.

DWR is required to obtain coverage under the CGP (currently, Order No. 2010-0014-DWQ) issued from the State Water Board, for projects that will disturb 1 or more acres of land. The intent of the CGP is to protect receiving waters from pollutants potentially occurring in construction stormwater discharges. The CGP requires the development and implementation of a SWPPP for NPDES permit coverage for stormwater discharges. Projects that disturb 1 or more acres of land have the potential to alter stormwater runoff. This includes projects that require excavation, grading, or stockpiling material at project sites, which could result in temporary and/or permanent changes to drainage patterns, paths, and facilities that would, in turn, cause changes in drainage flow rates, directions, and velocities of runoff, or constituents of runoff. A series of separate but related SWPPPs will be prepared by a QSD and will be implemented under the supervision of a QSP.

As part of the procedure to gain coverage under the CGP, the risk level of the site will be determined, based on the probability of a significant risk of causing or contributing to an exceedance of a water

quality standard based on the construction activities to be performed, the existing water quality, soil and sediment conditions, without the implementation of additional requirements (pursuant to Order No. 2009-0009-DWQ as amended by Order Nos. 2010-0014-DWQ and 2012-2006-DWQ). The risk is calculated separately for sediment and receiving water, with two risk categories for receiving water (low and high) and three risk categories for sediment risk (low, medium, and high). The overall project risk levels (1, 2, or 3) are then determined through a matrix, where Risk Level 1 applies to projects with low receiving water and sediment risks, Risk Level 3 for projects with high receiving water and sediment risks, and Risk Level 2 for all other combinations of sediment and receiving water risks. These project risk levels determine the level of protection (i.e., BMPs) and monitoring that is required for the project. If the site is Risk Level 2 or 3, water sampling for pH and turbidity will be required and the SWPPP will specify sampling locations and schedule, sample collection and analysis procedures, and recordkeeping and reporting protocols. Other typical requirements for such situations are provided below under Risk Levels 2 and 3.

Changes in runoff characteristics associated with construction activities have the potential to be detrimental to special-status fish and wildlife species as well as aquatic habitat and natural communities associated with receiving waters, through changes in ambient water temperature, sediment, and pollutants resulting from stormwater runoff. The objectives of the SWPPP are to identify pollutant sources associated with construction activities and operations that may affect the quality of stormwater and to identify, construct, and implement stormwater pollution prevention measures to reduce pollutants in stormwater discharges during and after construction. The SWPPP will be kept onsite during construction activity and operations and will be made available upon request to representatives of the San Francisco Bay and Central Valley Water Boards.

In accordance with the CGP, the SWPPP will describe site topographic, soil, and hydrologic characteristics; construction activities and schedule; construction materials, including sources of imported fill material to be used and other potential sources of pollutants at the construction site; potential non-stormwater discharges (e.g., trench dewatering); erosion and sediment control measures; “housekeeping” BMPs to be implemented; a BMP implementation schedule; a site and BMP inspection schedule; and ongoing personnel training requirements. The SWPPP will also include a hazardous materials management plan, described in AMM32.

These SWPPP provisions are intended to prevent water quality degradation related to pollutant discharge to receiving waters and to prevent or constrain changes to the pH of receiving waters. Performance standards will be met by implementing standard stormwater pollution prevention BMPs, as well as those tailored to specific-site conditions, including determining the risk level of individual construction sites. These environmental commitments mirror the requirements to gain and maintain coverage under the CGP. DWR will coordinate with the appropriate RWQCB to determine the appropriate aggregation of specific construction activities, or groups of activities, to be authorized under the CGP.

It is anticipated that multiple SWPPPs will be prepared for construction activities, with a given SWPPP prepared to cover a specific project component (e.g., intermediate forebay or tidal habitat restoration site) or groups of components (e.g., intakes). The risk level will be identified for each action covered by a specific SWPPP. These SWPPPs will generally follow the USEPA (2007) guidelines for such plans and would typically identify the following list of BMPs, which are requirements common to all risk-level sites; however, some detail is provided under the “Inspection and monitoring” bullet, below, on various risk-level requirements.

- Erosion control measures:

- Implement effective wind erosion BMPs, such as watering, application of soil binders/tackifiers, and covering stockpiles.
- Provide effective soil cover for inactive areas and all finished slopes and utility backfill areas, such as seeding with a native seed mix, application of hydraulic mulch and bonded fiber matrices, and installation of erosion control blankets and rock slope protection.
- Sediment control measures:
  - Prevent transport of sediment at the construction site perimeter, toe of erodible slopes, soil stockpiles, and into storm drains.
  - Capture sediment via sedimentation and stormwater detention facilities.
  - Reduce runoff velocity on exposed slopes.
  - Reduce offsite sediment tracking.
- Management measures for construction materials:
  - Cover and berm loose stockpiled construction materials.
  - Store chemicals in watertight containers.
  - Minimize exposure of construction materials to stormwater.
  - Designate refueling and equipment inspection/maintenance locations.
  - Control drift and runoff from areas treated with herbicides, pesticides, and other chemicals that may be harmful to aquatic habitats.
- Waste management measures:
  - Prevent offsite disposal or runoff of any rinse or wash waters.
  - Implement concrete and truck washout facilities and appropriately sized storage, treatment, and disposal practices.
  - Ensure the containment of sanitation facilities (e.g., portable toilets).
  - Clean or replace sanitation facilities (as necessary) and inspect regularly for leaks/spills.
  - Cover waste disposal containers during rain events and at end of every day.
  - Protect stockpiled waste material from wind and rain.
- Construction site dewatering and pipeline testing measures:
  - Reclaim site dewatering discharges to the extent practicable, or use for other construction purposes (e.g., dust control).
  - Implement appropriate treatment and disposal of construction site dewatering from excavations to prevent discharges to surface waters.
  - Dechlorinate pipeline testing discharges to surface waters.
- Accidental spill prevention and response measures:
  - Maintain equipment and materials necessary for cleanup of accidental spills onsite.
  - Clean up accidental spills and leaks immediately and dispose of properly.

- Ensure that trained spill response personnel are available.
- Non-stormwater management measures:
  - Control all non-stormwater discharges during construction.
  - Wash vehicles in such a manner as to prevent non-stormwater discharges to surface waters.
  - Clean streets in such a manner as to prevent non-stormwater discharges from reaching surface water.
  - Discontinue the application of any erodible landscape material during rain, or within 2 days before a forecasted rain event.
- Inspection and monitoring common to all risk level sites:
  - Ensure that all inspection, maintenance repair, and sampling activities at the construction site are performed or supervised by a QSP representing the discharger.
  - Develop and implement a written site-specific construction site monitoring program.
- Inspection, monitoring, and maintenance activities based on the risk level of the construction site (as defined in the State Water Board General Permit):
  - Risk Level 1 sites:
    - Perform weekly inspections of BMPs, and at least once each 24-hour period during extended storm events.
    - At least 2 business days (48 hours) prior to each qualifying rain event (a rain event producing 0.5 inch or more of precipitation), visually inspect: stormwater drainage areas to identify any spills, leaks, or uncontrolled pollutant sources; all BMPs to identify whether they have been properly implemented in accordance with the SWPP Plan; and stormwater storage and containment areas to detect leaks and ensure maintenance of adequate freeboard.
    - Visually observe stormwater discharges at all discharge locations within 2 business days (48 hours) after each qualifying rain event, identify additional BMPs as necessary, and revise the SWPPP accordingly.
    - Conduct minimum quarterly visual inspections of each drainage area for the presence of (or indications of prior) unauthorized and authorized non-stormwater discharges and their sources.
    - Collect one or more samples of construction site effluent during any breach, malfunction, leakage, or spill observed within the construction site during a visual inspection that could result in the discharge of pollutants to surface waters whether visually detectable or not.
  - Risk Level 2 sites:
    - Perform all of the same visual inspection, monitoring, and maintenance measures specified for Risk Level 1 sites.
    - Perform sampling and analysis of stormwater discharges to characterize discharges associated with construction activity from the entire disturbed area at all discharge points where stormwater is discharged offsite.

- At a minimum, collect and analyze three samples per day for pH and turbidity of a qualifying rain event. The CGP also requires the discharger to revise the SWPPP and immediately modify existing BMPs and/or implement new BMPs such that subsequent discharges are below the relevant NALs. It may be a violation of the CGP if the discharger fails to take corrective action to reduce the discharge below the NALs specified by the CGP.
- When an active treatment system is deployed on the site or a portion on the site, collect active treatment system effluent samples and measurements from the discharge pipe or another location representative of the nature of the discharge.
- Risk Level 3 sites:
  - Perform all of the same visual inspection, monitoring, and maintenance measure specified for Risk Level 1 and 2 sites.
  - In the event that a numerical effluent limit (NEL) of the CGP (i.e., pH and turbidity) is violated and has a direct discharge into receiving waters, the discharger will subsequently sample receiving waters for all parameter(s) monitored in the discharge. An exceedance of a NEL is considered a violation of the CGP, and the discharger must electronically submit all storm-event sampling results to the state and regional water boards via Stormwater Multiple Application and Report Tracking System (SMARTS) no later than 5 days after the conclusion of the storm event.
  - If disturbing 30 acres or more of the landscape and discharging directly into receiving waters, conduct a benthic macroinvertebrate bioassessment of receiving waters prior to and after commencement of construction activities to determine if significant degradation to the receiving water's biota has occurred. However, if commencement of construction is outside of an index period (i.e., the period of time during which bioassessment samples must be collected to produce results suitable for assessing the biological integrity of streams and rivers) for the site location, the discharger will participate in the State of California's Surface Water Ambient Monitoring Program.

The SWPPP will also specify the forms and records that must be uploaded to the State Water Board online SMARTS, such as quarterly non-stormwater inspection and annual compliance reports.

If the QSP determines the site is Risk Level 2 or 3, water sampling for pH and turbidity will be required, and the SWPPP will specify sampling locations and schedule, sample collection and analysis procedures, and recordkeeping and reporting protocols. In accordance with the CGP NAL requirements, the contractor's QSD will revise the SWPPP and modify existing BMPs or implement new BMPs when effluent monitoring indicates that daily average runoff pH is outside the range of 6.5 to 8.5 and that the daily average turbidity is greater than 250 NTUs. Such BMPs may include those that are more costly to construct and maintain, such as construction of sediment traps and sediment basins, use of Baker tanks, installation of rock slope protection, covering of stockpiles with water-repellant geotextiles, dewatering basins, and use of Active Treatment Systems. The ability of other areas to withstand excessive erosion and sedimentation may be increased by applying additional mulching, bonded fiber matrices, and erosion control blankets; reseeding with a native seed mix; and installing additional fiber rolls, silt fences, and gravel bag berms. The QSD may also specify changes in the manner and frequency of BMP inspection and maintenance activities. The determination of which BMP should be applied in a given situation is very site-specific. QSDs typically refer to the California Stormwater Quality Association's *Stormwater Best Management*



*Practice Handbook Portal: Construction* or the similar Caltrans manual for selecting BMPs for particular site conditions.

Additionally, if a given construction component is Risk Level 3, DWR will report to the State Water Board when effluent monitoring for that component indicates that daily average runoff pH is outside the range of 6.0 to 9.0 or the daily average turbidity is greater than 500 NTUs. In the event that the turbidity NEL is exceeded, DWR may also be required to sample and report pH, turbidity, and suspended sediment concentration of receiving waters to the State Water Board for the duration of construction.

The contractor will also conduct sampling of runoff effluent when a leak, spill, or other discharge of pollutants is detected.

The CGP has specific monitoring and action level requirements for the risk levels, which are summarized in Table 3B-8.

**Table 3B-8. SWPPP Monitoring and Action Requirements**

SWPPP Requirements	Risk Level/Type		
	1	2	3
Minimum stormwater and non-stormwater BMPs	✓	✓	✓
Numeric action levels (NAL)		✓	✓
NAL for pH: 6.5–8.5 pH units			
NAL for turbidity: 250 NTU			
Numeric effluent limitations (NEL)			✓
NEL for pH: 6–9 pH units			
NEL for turbidity: 500 NTU			
Visual monitoring (weekly; before, during, after rain events; non-stormwater)	✓	✓	✓
runoff monitoring		✓	✓
Receiving water monitoring			✓
Note: The State Water Board has suspended the applicability of NELs for pH and turbidity at Risk Level 3/LUP Type 3 construction sites. In addition, because receiving-water monitoring is required only if the NELs are triggered, all receiving-water monitoring requirements are also suspended. The Level 3/Type 3 NEL are presented here assuming that such NELs will be reinstated when project construction commences.			
BMP = best management practice.			
pH = potential hydrogen.			
NTU = nephelometric turbidity unit.			

The QSD preparing a SWPPP may include in the SWPPP BMPs such as preservation of existing vegetation, perimeter control, seeding, mulching, fiber roll and silt fence barriers, erosion control blankets, protection of stockpiles, watering to control dust entrainment, rock slope protection, tracking control, equipment refueling and maintenance, concrete and solid waste management, and other measures to ensure compliance with the pH and turbidity level requirements defined by the CGP. Partly because the potential adverse effect on receiving waters depends on location of a work area relative to a waterway, the BMPs will be site-specific. For example, BMPs applied to level island-interior sites will be different than BMPs applied to water-side levee conditions. The QSP will be responsible for day-to-day implementation of the SWPPP, including BMP inspections, maintenance, water quality sampling, and reporting to the State Water Board. If the water quality

sampling results indicate an exceedance of NALs and NELs for pH and turbidity, as described above, the QSD will modify the type and/or location of the BMPs by amending the SWPPP to reduce pH, turbidity, and other contaminants to acceptable levels, consistent with NALs and NELs and with the water quality objectives and beneficial uses set forth in the *Water Quality Control Plan (Basin Plan) for the Sacramento River Basin and the San Joaquin River Basin* (Central Valley Regional Water Quality Control Board 2007).

**Explanation of effectiveness:** The development and implementation of SWPPPs will serve to avoid and minimize direct and indirect effects on sensitive biological resources, which include fish, wildlife, rare plants, and sensitive natural communities such as tidal and nontidal marshes, vernal pool complex, and alkali seasonal wetlands. The BMPs listed above would serve to prevent construction-related chemicals and sediment carried by stormwater from entering aquatic, wetland, and terrestrial habitats where chemicals and sediment can cause injury and mortality of species and affect adjacent natural communities by changing the chemical and physical structure of soils and altering topography (e.g., fill of wetlands).

In absence of the implementation of AMM3, CMs, mitigation measures, and other AMMs, there would be a greater potential for significant impacts on species and natural communities due to loss of habitat and loss of species from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### 3B.4.4 AMM4 Erosion and Sediment Control Plan

An erosion and sediment control plan is typically required for ground-disturbing projects as part of the NPDES permitting process (U.S. Environmental Protection Agency 2007), depending on the size of the disturbed area. The proposed Phase II USEPA rules would cover projects with greater than 1 acre of ground disturbance. DWR commits to implementing measures as described below as part of the construction activities and in advance of any necessary permit. In accordance with these environmental commitments, DWR will ensure the preparation and implementation of erosion and sediment control plans to control short-term and long-term erosion and sedimentation effects and to restore soils and vegetation in areas affected by construction activities. It is anticipated that multiple erosion and sediment control plans will be prepared for construction activities, each taking into account site-specific conditions such as proximity to surface water, erosion potential, and drainage. The plans will include all the necessary state requirements regarding erosion control and will implement BMPs for erosion and sediment control that will be in place for the duration of construction activities. These BMPs will be incorporated into the SWPPP (see BDCP Appendix 3.C, Section 3.C.1.2.1, *Conduct Planning-Level Surveys*).

Erosion control measures will include the following.

- Install physical erosion control stabilization BMPs (hydroseeding with native seed mix, mulch, silt fencing, fiber rolls, sand bags, and erosion control blankets) to capture sediment and control both wind and water erosion. Erosion control may not utilize plastic monofilament netting or similar materials.
- Maintain emergency erosion control supplies onsite at all times during construction and direct contractor(s) to use these emergency stockpiles as needed. Ensure that supplies used from the emergency stockpiles are replaced within 48 hours. Remove materials used in construction of erosion control measures from the work site when no longer needed (property of the contractor).

- Design grading to be compatible with adjacent areas and result in minimal disturbance of the terrain and natural land features and minimize erosion in disturbed areas to the extent practicable.
- Divert runoff away from steep, denuded slopes, or other critical areas with barriers, berms, ditches, or other facilities.
- Retain native trees and vegetation to the extent feasible to stabilize hillsides, retain moisture, and reduce erosion.
- Limit construction, clearing of native vegetation, and disturbance of soils to areas of proven stability.
- Implement construction management and scheduling measures to avoid exposure to rainfall events, runoff, or flooding at construction sites to the extent feasible.
- Conduct frequent site inspections (before and after significant storm events) to ensure that control measures are intact and working properly and to correct problems as needed.
- Install drainage control features (e.g., berms and swales, slope drains) as necessary to avoid and minimize erosion.
- Install wind erosion control features (e.g., application of hydraulic mulch or bonded fiber matrix).

Sediment control measures will include the following.

- Use sediment ponds, silt traps, wattles, straw bale barriers, or similar measures to retain sediment transported by onsite runoff.
- Collect and direct surface runoff at nonerosive velocities to the common drainage courses.
- When ground-disturbing activities are required adjacent to surface water, wetlands, or aquatic habitat, the use of sediment and turbidity barriers, soil stabilization and revegetation of disturbed surfaces.
- Prevent mud from being tracked onto public roadways by installing gravel on primary construction ingress/egress points, and/or truck tire washing.
- Deposit or store excavated materials away from drainage courses and cover if left in place for more than 5 days or storm events are forecast within 48 hours.

After construction is complete, site-specific restoration efforts will include grading, erosion control, and revegetation. Self-sustaining, local native plants that require little or no maintenance and do not create an extreme fire hazard will be used. All disturbed areas will be recontoured to preproject contours, as feasible, and seeded with a native seed mix. Consideration will also be given to additional replacement of or upgrades to drainage facilities to avoid and minimize erosion. Paved areas damaged from use over and above ordinary wear-and-tear from lawful use by construction activities will be repaved to avoid erosion due to pavement damage.

***Explanation of effectiveness:*** The development and implementation of an erosion and sediment control plan will serve to avoid and minimize effects on sensitive biological resources, which include fish, wildlife, rare plants, and sensitive natural communities such as tidal and nontidal marshes, vernal pool complex, and alkali seasonal wetlands. The sediment and erosion control measures listed above would serve to prevent construction-related sediment from entering aquatic, wetland,

and terrestrial habitats where it can degraded water quality and affect adjacent natural communities by changing the chemical and physical structure of soils and altering topography (e.g., fill of wetlands). Excessive erosion resulting from water flowing off work areas and completed facilities can alter the topography of adjacent upland and aquatic habitat and contribute to water quality impairment in adjacent water bodies.

In absence of the implementation of AMM4, CMs, mitigation measures, and other AMMs, there would be a greater potential for significant impacts on these species and natural communities due to loss of habitat and loss of species from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### **3B.4.5 AMM5 Spill Prevention, Containment, and Countermeasure Plan**

As required by local, state, or federal regulations, DWR will develop a Spill Prevention, Containment, and Countermeasure Plan (SPCC) plan for each project. Each SPCC plan will comply with the regulatory requirements of the Spill Prevention, Control, and Countermeasure Rule (40 CFR 112) under the Oil Pollution Act of 1990. This rule regulates nontransportation-related onshore and offshore facilities that could reasonably be expected to discharge oil into navigable waters of the United States or adjoining shorelines. The rule requires the preparation and implementation of site-specific SPCC plans to prevent and respond to oil discharges that could affect navigable waters. Each SPCC plan will address actions used to prevent spills in addition to specifying actions that will be taken should any spills occur, including emergency notification procedures. The SPCC plans will include the following measures and practices.

- Discharge prevention measures will include procedures for routine handling of products (e.g., loading, unloading, and facility transfers) (40 CFR 112.7(a)(3)(i)).
- Discharge or drainage controls will be implemented such as secondary containment around containers and other structures, equipment, and procedures for the control of a discharge (40 CFR 112.7(a)(3)(ii)).
- Countermeasures will be implemented for discharge discovery, response, and cleanup (both the facility's capability and those that might be required of a contractor) (40 CFR 112.7(a)(3)(iii)).
- Methods of disposal of recovered materials will comply with applicable legal requirements (40 CFR 112.7(a)(3)(iv)).
- Personnel will be trained in emergency response and spill containment techniques, and will also be made aware of the pollution control laws, rules, and regulations applicable to their work.
- Petroleum products will be stored in nonleaking containers at impervious storage sites from which an accidental spill cannot escape.
- Absorbent pads, pillows, socks, booms, and other spill containment materials will be stored and maintained at the hazardous materials storage sites for use in the event of an accidental spill.
- Contaminated absorbent pads, pillows, socks, booms, and other spill containment materials will be placed in nonleaking sealed containers until transported to an appropriate disposal facility.
- When transferring oil or other hazardous materials from trucks to storage containers, absorbent pads, pillows, socks, booms, or other spill containment material will be placed under the transfer area.

- Refueling of construction equipment will occur only in designated areas that will be a minimum of 150 feet from surface waters and other sensitive habitats, such as wetlands.
- Equipment used in direct contact with water will be inspected daily for oil, grease, and other petroleum products. All equipment will be cleaned of external petroleum products prior to beginning work, where contact with water may occur, to prevent the release of such products to surface waters.
- Oil-absorbent booms will be used when equipment is used in or immediately adjacent to waters.
- All reserve fuel supplies will be stored only within the confines of a designated staging area, to be located a minimum of 150 feet from surface waters and other sensitive habitats, such as wetlands.
- Fuel transfers will take place a minimum of 150 feet from surface waters and other sensitive habitats, such as wetlands, and absorbent pads will be placed under the fuel transfer operation.
- Staging areas will be designed to contain contaminants such as oil, grease, fuel, and other petroleum products so that should an accidental spill occur they do not drain toward receiving waters or storm drain inlets.
- All stationary equipment will be staged in appropriate staging areas and positioned over drip pans.
- In the event of an accidental spill, personnel will identify and secure the source of the discharge and contain the discharge with sorbents, sandbags, or other material from spill kits and will contact appropriate regulatory authorities (e.g., National Response Center will be contacted if the spill threatens navigable waters of the United States or adjoining shorelines, as well as other appropriate response personnel).

Methods of cleanup may include the following.

- Physical methods for the cleanup of dry chemicals include the use of brooms, shovels, sweepers, or plows.
- Mechanical methods could include the use of vacuum cleaning systems and pumps.
- Chemical methods include the use of appropriate chemical agents such as sorbents, gels, and foams.

***Explanation of effectiveness:*** The implementation of an SPCC will serve to protect aquatic fish and wildlife in the Delta from the accidental discharge of oil into Delta waters. The SPCC will serve to protect primarily fish and aquatic birds from oils and other petroleum products used during construction and operations. The measures and practices listed above help to prevent accidents from happening and establish procedures for responding to oil spills.

In absence of the implementation of AMM5, CMs, mitigation measures, and other AMMs, there would be a greater potential for significant impacts on these species and natural communities due to loss of habitat and loss of species from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

## 3B.4.6 AMM6 Disposal and Reuse of Spoils, Reusable Tunnel Material, and Dredged Material

In the course of constructing or operating project facilities, substantial quantities of material are likely to be removed from their existing locations based upon their properties or the need for excavation of particular features. Spoils refer to excavated native soils and are associated with construction of pumping plant facilities and other water conveyance features. RTM refers to the mixture of saturated soils and biodegradable soil conditioners or additives that will be generated by tunneling operations and are appropriate for reuse based upon chemical characterization and physical properties. Dredged material refers to sediment removed from the bottom of a body of water for the purposes of in-water construction or water conveyance operations (e.g., sediment collected at intake sites), or water storage requirements. The quantities of these materials generated by construction or operation of project facilities will vary based on various factors, such as location, topography and structure being constructed. These materials will require handling, storage, and disposal, as well as chemical characterization, prior to any reuse. Temporary storage areas will be designated for these materials. However, to reduce the long-term effects on land use and potentially support implementation of other project elements, DWR will develop site-specific plans for the beneficial reuse of these materials, to the extent practicable.

### 3B.4.6.1 Temporary Storage Area Determination

Spoils, RTM, and dredged material will be temporarily or permanently stored in designated storage areas. Sediment collected at intake sites would be stored at solids lagoons adjacent to sedimentation basins. Selection of designated storage areas will be based upon, but not limited to, the following criteria.

- Material may be placed in project designated borrow areas.
- Areas for temporary storage will be located within 10 miles of the construction feature.
- Areas for temporary storage will not be located within 100 feet of existing residential or commercial buildings.
- Areas for temporary storage will not be located within 100 feet of a military facility.
- Areas for temporary storage will not be located within 100 feet of existing roads, rail lines, or infrastructure.
- To the extent practicable, material will not be temporarily stored in sensitive natural communities and habitat areas, including the following habitat types: wetlands and surface waters, vernal pool complex, alkali seasonal wetland complex or grasslands, and riparian areas. If it is necessary to temporarily store materials in any of the habitat types listed above, the appropriate special-status species AMMs will be followed for that habitat type.
- Placement of material potentially affecting western burrowing owl burrows will be avoided to the extent practicable (see AMM23 for description of burrow avoidance).
- Placement of material in greater sandhill crane foraging habitat will be minimized as described in AMM20.
- Placement of material in greater sandhill crane roost sites will be avoided as described in AMM20.

- Storage sites on Staten Island will be sized and located in coordination with USFWS, CDFW, and greater sandhill crane experts to minimize direct and indirect effects on greater sandhill crane.
- Placement of material in vernal pool complex or alkali seasonal wetland complex will be avoided to the extent practicable. If avoidance of these complexes is not practicable, the wetted vernal pool or alkali seasonal wetland acres will be avoided by at least 250 feet).
- Landowner concerns and preferences will be considered in designating sites for temporary storage. DWR will consult directly with landowners to refine the storage area footprint to further minimize impacts to surrounding land uses, including agricultural operations.
- Where practicable, dredged material will be disposed of on higher elevation land that is set back from surface water bodies a minimum of 150 feet. Upland disposal will help ensure that the material will not be in contact with surface water prior to its draining, characterization, and potential treatment.

Additional considerations have been made for the storage of RTM. For example, the proposed RTM storage area locations have been designed to be close to where the material will be brought to the surface, as well as close to where reuse is expected to occur. In some cases, storage areas are located adjacent to barge landings to facilitate movement to other reuse locations in the Delta.

- The area required for material storage is flexible and will depend on several factors.
- The speed with which material is brought to the surface, stored, dried, tested, and moved to reuse locations will be important in determining the final size of storage areas. If material can be dried faster and moved offsite more quickly, less area will be needed at each location.
- The depth to which the material is stacked. Material that is stored in deeper piles will require less area but may dry more slowly, extending the time that is needed. It was assumed that RTM would be placed in piles with a depth of six feet.
- The proportion of material at one storage area or another. There will be flexibility during construction to prioritize material storage in some areas as opposed to other areas, based on feasibility of reuse or minimization of impacts.

### **3B.4.6.2 Temporary Storage Site Preparation**

A portion of the temporary storage sites selected for storage of spoils, RTM, and dredged material will be set aside for topsoil storage. The topsoil will be saved for reapplication to disturbed areas postconstruction. Vegetative material from work site clearing will be chipped, stockpiled, and spread over the topsoil after earthwork is completed, when practicable and appropriate to do so and where such material does not contain seeds of undesirable nonnative species (i.e., nonnative species that are highly invasive and threaten the ecological function of the natural community to be restored in that location). Cleared areas will be grubbed as necessary to prepare them for grading or other construction activities. Rocks and other inorganic grubbed materials will be used to backfill borrow areas. The contractor will remove from the work site all debris, rubbish, and other materials not directed to be salvaged, and will dispose of them in an approved disposal site after obtaining all permits required.

### **3B.4.6.3 Draining, Chemical Characterization, and Treatment**

RTM and associated decant liquid will undergo chemical characterization by the contractor(s) prior to reuse or discharge, respectively, to determine whether it will meet NPDES and Central Valley

Water Board requirements. Should RTM decant liquid constituents exceed discharge limits, these tunneling byproducts will be treated to comply with NPDES permit requirements. Discharges from RTM draining operations will be conducted in such a way as to not cause erosion at the discharge point. If RTM liquid requires chemical treatment, chemical treatment will ensure that RTM liquid will be nontoxic to aquatic organisms.

While additives used to facilitate tunneling will be nontoxic and biodegradable, it is possible that some quantity of RTM will be deemed unsuitable for reuse. In such instances, which are anticipated to occur in less than 1% each of excavated spoils, RTM, and dredged material, the material will be disposed of at a site for which disposal of such material is approved.

Hazardous materials excavated during construction will be segregated from other construction spoils and properly handled in accordance with applicable federal, state, and local regulations. Riverine or in-Delta sediment dredging and dredge material disposal activities may involve potential contaminant discharges not addressed through typical NPDES or the State Water Board CGP processes. Construction of dredge material disposal sites will likely be subject to the State Water Board General Permit (Order No. 2009-0009-DWQ). The following list of BMPs will be implemented during handling and disposal of any potentially hazardous dredged material.

- DWR will ensure the preparation and implementation of a pre-dredge sampling and analysis plan (SAP). The SAP will be developed and submitted by the contractors as part of the water plan required pursuant to standard DWR contract specifications (Section 01570). Prior to initiating any dredging activity, the SAP will evaluate the presence of contaminants that may affect water quality from the following discharge routes.
  - Instream discharges during dredging.
  - Direct exposure to contaminants in the material through ingestion, inhalation, or dermal exposure.
  - Effluent (return flow) discharge from an upland disposal site.
  - Leachate from upland dredge material disposal that may affect groundwater or surface water.
- Conduct dredging within the allowable in-water work windows established by USFWS, NMFS, and CDFW.
- Conduct dredging activities in a manner that will not cause turbidity in the receiving water, as measured in surface waters 300 feet down-current from the construction site, to exceed the Basin Plan objectives beyond an approved averaging period by the Central Valley Water Board and CDFW. Existing threshold limits in the Basin Plan for turbidity generation are as follows.
  - Where natural turbidity is between 0 and 5 NTUs, increases will not exceed 1 NTU.
  - Where natural turbidity is between 5 and 50 NTUs, increases will not exceed 20%.
  - Where natural turbidity is between 50 and 100 NTUs, increases will not exceed 10 NTUs.
  - Where natural turbidity is greater than 100 NTUs, increases will not exceed 10%.
- If turbidity generated during dredging exceeds implementation requirements for compliance with the Basin Plan objectives, silt curtains will be used to control turbidity. Exceptions to turbidity limits set forth in the Basin Plan may be allowed for dredging operations; in this case,



an allowable zone of dilution within which turbidity exceeds the limits will be defined and prescribed in a discharge permit.

- The dredge material disposal sites will be designed to contain all of the dredged material and all systems and equipment associated with necessary return flows from the dredge material disposal site to the receiving water will be operated to maximize treatment of return water and optimize the quality of the discharge.
- The dredged material disposal sites will be designed by a registered professional engineer.
- The dredged material disposal sites will be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
- Two feet of freeboard above the 100-year flood event elevation will be maintained in all dredge material disposal site settling ponds at all times when they may be subject to washout from a 100-year flood event.
- Dredging equipment will be kept out of riparian areas and dredged material will be disposed of outside of riparian corridors.

Temporary storage sites will be constructed using appropriate BMPs such as erosion and sediment control measures (*AMM4 Erosion and Sediment Control Plan* and *AMM3 Stormwater Pollution Prevention Plan*) to prevent discharges of contaminated stormwater to surface waters or groundwater.

Once the excavation spoils, RTM, or dredged material have been suitably dewatered, and as the constituents of the material will allow, it will be placed in either a lined or unlined storage area, suitable for long-term storage. These long-term storage areas may be the same areas in which the material was previously dewatered or it may be a new area adjacent to the dewatering site. The storage areas will be created by excavating and stockpiling the native topsoil for future reuse. Once the area has been suitably excavated, and if a lined storage area is required, an impervious liner will be placed on the invert of the material storage area and along the interior slopes of the berms surrounding the pond. Due to the expected high groundwater tables, it is anticipated that there will be minimal excavation for construction of the long-term material storage areas. Additional features of the long-term material storage areas will include berms and erosion protection measures to contain storm runoff as necessary and provisions to allow for truck traffic during construction.

#### **3B.4.6.4 Material Reuse Plans**

Prior to construction, draining, and chemical characterization of excavation spoils, RTM, and dredged material, DWR will identify sites for reusing such materials to the extent practicable, in connection with construction activities and habitat restoration and protection activities, as well as potential beneficial uses associated with flood protection and management of groundwater levels within the Plan Area. DWR will undertake a thorough investigation to identify sites for the appropriate reuse of material, and, based upon the properties of the material and in consultation with other interested parties, DWR will identify the specific site for that material. Potential methods of reuse may include the following.

- Fill material for construction of embankments or building pads.
- Fill material for levee maintenance.
- Fill material for habitat restoration projects.

- 1       • Fill material for roadway projects.
- 2       • Fill material for localized subsidence reversal.
- 3       • Material for flood response.
- 4       • Material to fill project-related borrow areas.
- 5       • Other beneficial means of reuse.

6       Material applied to reduce the localized effects of subsidence will be placed on lower elevation lands  
 7       and lands adjacent to levees to minimize effects on agricultural practices and improve levee  
 8       stability. The material may be left in place and used as stockpile to assist in flood response; however,  
 9       to the extent feasible, the material will be relocated and the storage site restored to its former  
 10      condition in areas where such restoration is desirable for the conservation of special-status species,  
 11      such as locations supporting greater sandhill crane foraging habitat. The feasibility of these  
 12      approaches to reuse will depend on the suitability of the material for each purpose based on testing  
 13      of relevant properties. Site-specific factors such as local demand for materials and the ability to  
 14      transport the materials will also be important considerations in assessing options for reuse. To the  
 15      extent that the reuse of the materials for these purposes may lead to adverse environmental effects,  
 16      such effects will be addressed through site-specific environmental documents prepared under the  
 17      National Environmental Policy Act and California Environmental Quality Act. These could include  
 18      environmental documents for proposed habitat restoration projects for which the materials can be  
 19      used.

20      DWR will consult relevant parties, such as landowners, reclamation districts, flood protection  
 21      agencies, federal and state agencies with jurisdiction in the Delta, and counties, in developing such  
 22      site-specific spoil, RTM, and dredged material reuse plans. Where DWR determines that it is  
 23      appropriate that materials be used to prepare land at elevations suitable for project-related  
 24      restoration or protection projects, it will coordinate in developing site-specific plans for  
 25      transporting and applying the materials to work sites.

26      Following removal of excavation spoils, RTM, and dredged material from temporary disposal sites,  
 27      stockpiled topsoil at these areas will be reapplied, and disturbed areas will be returned, to the  
 28      extent practicable, to preconstruction conditions, as specified in AMM10. The areas will be carefully  
 29      graded to reestablish preconstruction surface conditions and elevations and features will be  
 30      reconstructed (e.g., irrigation and drainage facilities). Restoration of the RTM draining sites will be  
 31      designed to prevent surface erosion and subsequent siltation of adjacent water bodies. Following  
 32      these activities, the land will be suitable for returning to agricultural production, under the  
 33      discretion of the landowner. Such areas may also be appropriate for the implementation of habitat  
 34      restoration or protection in consideration of the biological goals and objectives.

35      In some instances, it may not be practicable to transport and reuse spoil, RTM, or dredged materials  
 36      due to factors such as the distances and costs involved and/or any environmental effects associated  
 37      with transport (e.g., unacceptable traffic concerns or levels of diesel emissions). In such instances,  
 38      sites will be evaluated for the potential to reapply topsoil over the spoils, RTM, or dredged material  
 39      and to continue or recommence agricultural activities. If, in consultation with landowners and any  
 40      other interested parties, DWR determines that continued use of the land for agricultural or habitat  
 41      purposes will not be practicable, the potential for other productive uses of the land will be  
 42      examined, including stockpile and staging areas for flood response or hosting solar or wind power  
 43      generation facilities. Such instances may require the acquisition of interest in the land and/or

coordination with utilities or other entities; specific arrangements will be made on a case-by-case basis.

### 3B.4.6.5 Potential Environmental Effects

It is anticipated that one or more of these disposal and reuse methods could be implemented on any individual spoil, RTM, or dredged material site. Depending on which combination of these approaches is selected, implementation of material reuse plans could create environmental impacts requiring site-specific analysis under CEQA and/or NEPA. Many of these activities would require trucks or barges to gather and haul materials from one section of the Plan Area to another. For instance, reuse of material in the implementation of tidal habitat could require material to be transported to locations in the West Delta ROA (including Sherman and Twitchell Islands) or the Cosumnes/Mokelumne ROA (including Glannvale Tract and McCormack-Williamson Tract), among other areas. Locations for reuse in support of levee stability could include areas protected by nonproject levees or where levee problems have been reported in the past, including Staten Island, Bouldin Island, Empire Tract, Webb Tract, Bacon Island, or other places in the Delta. While reuse locations near to the spoil or RTM areas would be preferred, such activity would require use of local roadways, which could lead to short-term effects on traffic, noise levels, and air quality. Similarly, earthwork and grading activities to restore sites to preconstruction conditions and to apply the materials consistent with their reuse could create noise and effects on air quality during the implementation of reuse plans.

If materials are applied for the purposes of flood protection, flood response, habitat restoration or subsidence reversal, it is possible that existing topsoil could be overcovered and that Important Farmland or farmland with habitat value for one or more special-status species could be disturbed temporarily or converted from active agricultural uses. Additionally, materials placed near levees could affect drainage and/or irrigation infrastructure. If material is used for habitat restoration that would have otherwise been implemented as part of the project, reuse of materials could offset the need for fill materials from other sources. Such effects would be described in further detail by individual site-specific environmental review for habitat restoration activities.

Depending on the selected reuse strategies, however, implementation of spoil, RTM, and dredged material reuse plans could also result in beneficial effects associated with flood protection and response, habitat creation, and depth to groundwater in areas where the ground level is raised.

***Explanation of effectiveness:*** The implementation of AMM6 will ensure that spoils, RTM, and dredge materials are properly stored, disposed, of and/or screened for reuse, which would avoid and minimize direct and indirect effects on biological and other resources (e.g., water, air) during and following construction. The process outlined in AMM6 will prevent the exposure of fish, wildlife, and plants to contaminants during construction that could cause injury and mortality. AMM6 also will prevent the inappropriate storage and reuse of these materials where they may substantially alter future soils and water quality, which could permanently alter natural community composition in adjacent areas and expose fish and wildlife to contaminants.

In absence of the implementation of this avoidance and minimization measure, CMs, and other AMMs, there would be a greater potential for significant impacts on biological resources. Refer to the impact analyses for each resource for more detail.

### 3B.4.7 AMM7 Barge Operations Plan

For each project that requires the use of a barge, DWR will develop a barge operations plan as required by local, state, or federal regulation. Each plan will be developed and submitted by the construction contractors pursuant to standard DWR contract specifications as part of the traffic plans required by those specifications (Section 01570 of standard DWR construction contracts). The barge operations plan will be part of a comprehensive traffic control plan coordinated with the U.S. Coast Guard for large channels. The comprehensive traffic control plan will address traffic routes and machines used to deliver materials to and from the barges. The barge operations plan will address the following.

- Bottom scour from propeller wash.
- Bank erosion or loss of submerged or emergent vegetation from propeller wash and/or excessive wake.
- Accidental material spillage.
- Sediment and benthic community disturbance from accidental or intentional barge grounding or deployment of barge spuds (extendable shafts for temporarily maintaining barge position) or anchors.
- Hazardous materials spills (e.g., fuel, oil, hydraulic fluids).

The barge operations plan will serve as a guide to barge operations and to a biological monitor who will evaluate barge operations on a daily basis during construction with respect to stated performance measures. This plan, when approved by the DWR and other resource agencies, will be read by barge operators and kept aboard all vessels operating at the construction sites and barge landings.

#### 3B.4.7.1 Sensitive Resources

The barge operations plan is intended to protect aquatic species and habitat in the vicinity of barge operations. The plan will be developed to avoid barge-related effects on aquatic species; if and when avoidance is not possible, the plan will include provisions to minimize effects on aquatic species as described in Section 3B.4.7.3, *Avoidance Measures*, Section 3B.2.8.3.1, *Environmental Training*, and Section 3B.2.8.3.2, *Dock Approach and Departure Protocol*. The sensitive resources potentially affected by barge maneuvering and anchoring in affected areas are listed below.

- Sediments that could cause turbidity or changes in bathymetry, if disturbed.
- Bottom-dwelling (benthic) invertebrates that provide the prey base for a number of aquatic species.
- Riparian vegetation that provides shade, cover, habitat structure, and organic nutrients to the aquatic environment.
- Submerged aquatic vegetation that provides habitat structure and primary (plant) production.

#### 3B.4.7.2 Responsibilities

Construction contractors operating barges in the process of constructing the water conveyance facilities will be responsible for the following.

- Operate vessels safely and following the barge operations plan and other reasonable measures to prevent adverse effects on aquatic resources of the Delta.
- Read, understand, and follow the barge operations plan.
- Report to the project biological monitor any vessel grounding or other deviations from the barge operations plan that could have resulted in the disturbance of bottom sediments, damage to river banks, or loss of submerged, emergent, or riparian vegetation.
- Immediately report material fuel or oil spills to the CDFW Office of Spill Prevention and Response, the project biological monitor, and DWR.
- Follow all other relevant plans, including the hazardous materials management plan, SWPPP, and SPCC plan.

The biological monitor will be responsible for the following.

- Observe a sample of barge operation activities including loading and unloading at least one barge at each of the barge loading and unloading facilities.
- Provide same-day reports to DWR on any observed problems with barge operations.
- Provide annual reports to DWR, summarizing monitoring observations over the course of each construction year, including an evaluation of the plan performance measures. The annual report will also include a description of and representative photographs and/or videos of conditions of river banks and vegetation.
- Visit each intake and barge landing site to determine the extent of emergent and riparian vegetation, bank conditions, and general site conditions during the growing season prior to initiation of construction and then annually during and after construction. Monitor construction including observation of barge landing, loading, or unloading; departure of one or more barges at each active barge landing site and the condition of both river banks at each landing site; pile-driving; and other in-water construction activity as directed by DWR. The condition of river banks and vegetation will be photographed and verbally described in an annual monitoring report.

### **3B.4.7.3 Avoidance Measures**

The following avoidance measures are being implemented to ensure that the goal of avoiding impacts on aquatic resources from tugboat and barge operations will be achieved: training of tug boat operators, limiting vessel speed to minimize the effects of wake impinging on unarmored or vegetated banks and the potential for vessel wake to strand small fish, limiting the direction and/or velocity of propeller wash to prevent bottom scour and loss of aquatic vegetation, and prevention of spillage of materials and fluids from vessels.

If deviations from these procedures are required to maintain the safety of vessels and crew, the biological monitor will be informed of the circumstances and any apparent impacts on water quality, habitats, fish, or wildlife. Any such impacts will be brought to the attention of the applicable fish and wildlife agency to ascertain and implement appropriate remedial measures.

#### 3B.4.7.4 Environmental Training

All pilots operating at the barge landings and intake construction sites will be required to read and follow this plan and to keep a copy aboard and accessible while working at these sites. All pilots responsible for operating a vessel at either the intake or barge landing sites will read this plan and sign an affidavit as provided in the plan.

#### 3B.4.7.5 Dock Approach and Departure Protocol

DWR will develop and implement a protocol for dock approach and departure to ensure the following.

- Vessel operators will obey all federal and state navigation regulations that apply to the Delta.
- All vessels will approach and depart from the intake and barge landing sites at dead slow in order to reduce vessel wake and propeller wash at the sites frequented by tug and barge traffic.
- To minimize bottom disturbance, anchors and barge spuds will be used to secure vessels only when it is not possible to tie up.
- Barge anchoring will be preplanned. Anchors will be lowered into place and not be allowed to drag across the channel bed.
- Vessel operators will limit vessel speed as necessary to maintain wake of less than 2 feet (66 centimeters) at shore.
- Vessel operators will avoid pushing stationary vessels up against the cofferdam, dock, or other structures for extended periods, because this could result in excessive directed propeller wash impinging on a single location. Barges will be tied up whenever possible to avoid the necessity of maintaining stationary position by tugboat or by the use of barge spuds.
- Barges will not be anchored where they will ground during low tides.
- All vessels will obey U.S. Coast Guard regulations related to the prevention, notification, and cleanup of hazardous materials spills.
- All vessels will keep an oil spill containment kit and spill prevention and response plan onboard.
- In the event of a fuel spill, CDFW Office of Spills Prevention and Response will be contacted immediately at 800-852-7550 or 800-OILS-911 (800-645-7911) to report the spill.
- When transporting loose materials (e.g., sand, aggregate), barges will use deck walls or other features to prevent loose materials from blowing or washing off of the deck.

#### 3B.4.7.6 Performance Measures

Performance will be assessed based on the results of the biological monitoring reports. The assessment will evaluate observations for the following indicators of impacts.

- **Emergent vegetation loss.** The extent and dominant species of emergent vegetation will be determined and mapped by a global positioning system (GPS) unit at and cross-channel of each of the intake and barge landing sites during the growing seasons prior to, during, and after construction. Extent will be mapped as linear coverage along the landing and opposite banks. In the event that the linear extent of emergent vegetation is found to have decreased by 20% or more following construction (or as otherwise conditioned by applicable CDFW streambed

alteration agreements), the position and nature of the change will be evaluated for the probability that the loss was due to barge grounding, propeller wash, or other effects related to barge operations. Adequate performance will be achieved if the linear extent of riparian and emergent vegetation following construction is at least 80% of the preconstruction extent (or as otherwise conditioned by applicable CDFW streambed alteration agreements).

- **Bank erosion and riparian vegetation loss.** The linear extent of bank erosion will be mapped by GPS at each of the intake and barge landing sites prior to, during, and after construction. Photos and written descriptions will be recorded for each area of eroded bank to describe the extent of the erosion. In the event that the linear extent of eroded bank is found to have increased by 20% or more following construction, the position and nature of the change will be evaluated for the probability (low, moderate, or high) that the erosion was due to barge grounding, propeller wash, or other effects related to barge operations, and preconstruction and postconstruction photographs will be compared to determine if riparian vegetation was also lost as a result of the erosion.
- **Cargo containment.** The biological monitor will note the use of deck walls or other appropriate containment during loading and unloading of sand, aggregate, or other materials from a barge at each landing site. Adequate performance will be achieved, if appropriate measures are in use during each observed loading and unloading. In the unlikely event that an accidental spill occurs in spite of appropriate containment, the barge crew will describe the type, amount, and location of the spill to the biological monitor. The biological monitor will make observations at the site of the material spill and evaluate the potential impacts of the spill on biological resources for evaluation of whether mitigation is required and for inclusion in the annual monitoring report. Any such impacts will be brought to the attention of the applicable fish and wildlife agency to ascertain and implement appropriate remedial measures.
- **Fuels spill prevention.** Vessels operating in accordance with the SPCC plan and all applicable federal, state, and local safety and environmental laws and policies governing commercial vessel and barge operations will be considered to be performing adequately with regard to fuel spill prevention.
- **Barge grounding.** Barges are not to be grounded or anchored where falling tides are reasonably expected to cause grounding during a low tide. Barge grounding has the potential to disturb bottom sediments and benthic organisms, as well as creating a temporary obstacle to fish passage. Performance will be considered adequate, if no cases of vessel grounding occur.

### 3B.4.7.7 Contingency Measures

In the event that the performance measures are not met, DWR will coordinate with NMFS, USFWS, CDFW, and the Central Valley Water Board to determine appropriate rectification or compensation for impacts on aquatic resources.

**Explanation of effectiveness:** The barge operations plan will serve to avoid and minimize effects on tidal perennial aquatic, tidal wetlands, and riparian habitat and the fish and wildlife that utilize these habitats. The plans call for monitors to ensure that barge traffic is not leading to a loss of emergent vegetation, excessive bank erosion, or loss of riparian vegetation adjacent to barge landing areas and barge routes. These plans will also ensure that barge activities do not affect the aquatic environment through accidental spills, which could result in injury and mortality of aquatic life.

In absence of the implementation of this avoidance and minimization measure, CMs, and other AMMs, there would be a greater potential for significant impacts on biological resources. Refer to the impact analyses for each resource for more detail.

### **3B.4.8 AMM8 Fish Rescue and Salvage Plan**

Fish rescue operations will occur at any in-water construction site where dewatering and resulting isolation of fish may occur (e.g., when dewatering creates isolated pools within the stream channel). Fish rescue and salvage plans will be developed by DWR and will include detailed procedures for fish rescue and salvage to minimize the number of Chinook salmon, steelhead, green sturgeon, and other fish stranded during placement and removal of cofferdams at the intake construction sites. The plans will identify the appropriate procedures for removing fish from the construction zone and preventing fish from reentering the construction zone during construction or prior to dewatering.

Prior to any in-water construction activities that could result in entrapping fish, a fish rescue and salvage plan will be implemented. The following draft plan includes detailed procedures for fish rescue and salvage to minimize the number of covered fish stranded during construction activities. The construction activity with the most potential to entrap fish is the construction of the in-water cofferdams at the intake sites. Although the following discussion focuses primarily on the application of this plan to cofferdam construction, the general procedures would apply to any in-water activity with the potential to entrap fish. The plan will be submitted to the fish and wildlife agencies for their review and acceptance and revised accordingly. An authorization letter from CDFW will be required before in-water construction activities that could result in needing to rescue or salvage trapped fish can occur.

Construction activities in the river channels will typically include placement of cofferdams to isolate construction areas from the stream channel and minimize adverse effects on fish and other aquatic species from subsequent construction activities. However, these species can become trapped within the cofferdam and need to be rescued or salvaged prior to cofferdam dewatering. Fish that become trapped in isolated pockets of water may be killed during dewatering of the construction area or other construction activities. Therefore, fish rescue operations will occur at any in-water construction site, particularly where dewatering and resulting isolation of fish may occur (e.g., when dewatering creates isolated pools within the stream channel). All fish rescue and salvage operations will be conducted under the guidance of a qualified fish biologist and in accordance with required permits. These activities will occur during approved in-water construction work windows (typically between June 1 and October 31).

The plan will identify the appropriate procedures for excluding fish from the construction zones, and procedures for removing fish, should they become trapped. The primary procedure will be to block off the construction area and use seines (nets) and/or dip nets to collect and remove fish, although electrofishing techniques may also be permitted. In the case of cofferdam construction, the cofferdam would be installed to block off the construction area, before fish removal activities occur. For other in-water construction activities, block nets or other temporary exclusion methods (i.e., sandbag dike) could be used to isolate the construction area prior to the fish removal process.

The appropriate fish collection method will be determined by a qualified fish biologist, in consultation with the designated fish and wildlife agency biologist, and based on site-specific conditions prior to dewatering the cofferdam. Contact information provided by NMFS will be supplied to the biologist onsite. Prior to construction site dewatering, fish will be captured and



relocated to avoid direct mortality and to minimize take. Capture, release, and relocation measures will be consistent with the general guidelines and procedures those set forth in Chapter 9 of the most recent edition of the *California Salmonid Stream Habitat Restoration Manual* (California Department of Fish and Game 2010) to minimize impacts on aquatic habitat and species. Collection methods may include use of seines (nets) and/or dip nets to collect and remove fish; electrofishing techniques may also be permitted.

All fish rescue and salvage operations will be conducted under the guidance of a qualified fish biologist. These activities will occur during approved in-water construction work windows.

Unless otherwise required by project permits, the construction contractor will provide the following.

- A minimum 7-day notice to the appropriate fish and wildlife agencies, prior to an anticipated activity that could result in isolating fish, such as installation of a cofferdam.
- A minimum 48-hour notice to the appropriate fish and wildlife agencies of dewatering activities that are expected to require fish rescue.
- Unrestricted access for the appropriate fish and wildlife agency personnel to the construction site for the duration of implementation of the fish rescue plan.
- Temporary cessation of dewatering if fish rescue workers determine that water levels may drop too quickly to allow successful rescue of fish.
- A work site that is accessible and safe for fish rescue workers.

**Explanation of effectiveness:** Implementation of this AMM, along with its corresponding environmental commitment (see Section 3B.2.7), would minimize the number of Chinook salmon, steelhead, green sturgeon, delta smelt, and other covered fish stranded during project-related construction activities, especially during the placement and removal of cofferdams at the intake construction sites. The effectiveness of fish salvage and rescue in accomplishing this would be species-, site-, and method-specific, and mortality to fish species could occur during rescue and release operations. It is not likely that implementation of this AMM alone would ensure less-than-significant construction-related impacts on covered fish species because these impacts are multi-faceted (i.e., the result of both temporary and permanent alteration of migration, spawning and rearing habitats due to underwater noise from pile driving, changes in water quality due to potential hazardous materials spills and turbidity, for example). Other environmental commitments and AMMs (e.g., those requiring SWPPPs, spill prevention, containment, and countermeasure plans, hazardous materials management plans, and barge operations plan) would also be implemented to help reduce the severity of these impacts to a less-than-significant level. Additionally, implementation of mitigation measures for significant impacts on multiple fish species underwater noise due to pile driving would be relied upon to reduce these impacts to a less-than-significant level (e.g., Impact AQUA-1, Impact AQUA-19, and Impact AQUA-37).

### 3B.4.9 AMM9 Underwater Sound Control and Abatement Plan

DWR will develop and implement an underwater sound control and abatement plan outlining specific measures that will be implemented to avoid and minimize the effects of underwater construction noise on covered fish species, particularly the underwater noise effects associated with

1 impact pile driving activities. Potential underwater noise effects on covered fish species from impact  
 2 pile driving will be avoided and minimized by regulating the period during which impact pile driving  
 3 is permitted and by controlling and/or abating underwater noise generated during impact pile  
 4 driving.

5 The plan will be provided to the appropriate fish and wildlife agencies for their review and approval  
 6 prior to implementation of any in-water impact pile driving activities. The plan will evaluate the  
 7 potential effects of underwater noise on covered fish species in the context of applicable and interim  
 8 underwater noise thresholds established for disturbance and injury of fish (California Department  
 9 of Transportation 2009). The thresholds include the following.

- 10 • Injury threshold for fish of all sizes includes a peak sound pressure level of 206 decibels (dB)  
 11 relative to 1 micropascal.
- 12 • Injury threshold for fish less than 2 grams is 183 dB cumulative sound exposure level, and 187  
 13 dB cumulative sound exposure level for fish greater than or equal to 2 grams.
- 14 • Disturbance threshold for fish of all sizes is 150 dB root mean square relative to 1 micropascal.

15 The specific number of pilings that will be driven per day with an impact pile driver, and thus the  
 16 number of pile strikes per day, will be defined as part of the design of project elements that require  
 17 pilings.

18 Impact pile driving activities may be required at the north Delta intake sites, barge landing sites, at  
 19 construction sites at and near Clifton Court Forebay, and at the Head of Old River Gate construction  
 20 site. The sound control and abatement plan will restrict in-water work to the in-water work window  
 21 specified in permits issued by the fish and wildlife agencies.

22 The underwater noise generated by impact pile driving will be abated using the best available and  
 23 practicable technologies. Examples of such technologies include, but are not limited to, the use of  
 24 cast-in-drilled-hole rather than driven piles; use of vibratory rather than impact pile driving  
 25 equipment; using an impact pile driver to proof piles initially placed with a vibratory pile driver;  
 26 noise attenuation using of pile caps or cushions (e.g., wood or micarta), bubble curtains, air-filled  
 27 fabric barriers, or isolation piles; or installation of piling-specific cofferdams. Specific techniques to  
 28 be used will be selected based on site-specific conditions and practicality.

29 In addition to establishing protocols for attenuating underwater noise levels produced during in-  
 30 water construction activities, DWR will develop operational protocols when impact pile driving is  
 31 necessary, to further minimize potential underwater noise impacts. These operational protocols will  
 32 be used to minimize the effects of impact pile driving on covered fish species. These protocols may  
 33 include, but not be limited to, the following: monitoring the in-water work area for fish that may be  
 34 showing signs of distress or injury as a result of pile driving activities and stopping work when  
 35 distressed or injured fish are observed; initiating impact pile driving with a “soft-start,” such that  
 36 pile strikes are initiated at reduced impact and increase to full impact over several strikes to provide  
 37 fish an opportunity to move out of the area; and when more than one pile driving rig is employed,  
 38 ensure pile driving activities are initiated in a way that provides an escape route and avoids  
 39 “trapping” fish between pile driving and underwater noise levels that could potentially cause injury.  
 40 These protocols are expected to avoid and minimize the overall extent, intensity, and duration of  
 41 potential underwater noise effects associated with impact pile driving activities.

42 ***Explanation of effectiveness:*** Implementation of this AMM would avoid and minimize the effects of  
 43 underwater construction noise on covered fish species, particularly the underwater noise effects

associated with impact pile driving activities. Potential underwater noise effects on covered fish species from impact pile driving will be avoided and minimized by regulating the period during which impact pile driving is permitted and by controlling and/or abating underwater noise generated during impact pile driving. The effectiveness of this plan would be species-, site-, and method-specific, and mortality to fish species could occur during construction. Fish and wildlife agencies will use the Caltrans fish injury noise thresholds, as cited above, as the baseline for this plan. Coordination with the fish and wildlife agencies will occur as the number of strikes per day is better defined during design and the effects analysis for specific pile driving actions is updated/revised. Because coordination would occur simultaneously with construction, plans could be updated or changed given on the specific fish species, sites, or types of construction. Therefore, it is not likely that implementation of this AMM alone would ensure less-than-significant construction-related impacts on covered fish species because construction impacts are multi-faceted (i.e., the result of both temporary and permanent alteration of migration, spawning and rearing habitats due to underwater noise from pile driving, changes in water quality due to potential hazardous materials spills and turbidity, for example). Other environmental commitments and AMMs (e.g., those requiring SWPPPs, spill prevention, containment, and countermeasure plans, hazardous materials management plans, and barge operations plan) would also be implemented to help reduce the severity of these impacts to a less-than-significant level. Additionally, implementation of mitigation measures for significant impacts on multiple fish species underwater noise due to pile driving would be relied upon to reduce these impacts to a less-than-significant level (e.g., Impact AQUA-1, Impact AQUA-19, and Impact AQUA-37).

### **3B.4.10 AMM10 Restoration of Temporarily Affected Natural Communities**

Prior to initiating covered activities that will result in temporary effects on natural communities within the Plan Area, site-specific restoration and monitoring plan will be developed. Restoration and monitoring plans will be prepared by DWR and kept on file for review by any of the fish and wildlife agencies at their request. A list of restoration and monitoring plans for temporary construction impacts will be provided to the fish and wildlife agencies.

Restoration and monitoring plans will include methods for stockpiling and storing topsoil, restoring soil conditions, and revegetating disturbed areas; monitoring and maintenance schedules; adaptive management strategies; reporting requirements; and success criteria. Restoration and monitoring plans will be prepared by DWR in consultation with CDFW, USFWS, and NMFS. These site-specific restoration and monitoring plans may be modified over time and in light of changing circumstances. Restoration will commence immediately after construction is completed, or if construction is completed during a season that is inappropriate for planting the natural community, restoration will commence during the appropriate season for restoring that natural community (e.g., fall plantings for riparian natural community) and within 1 year of completing construction.

With the exception of some borrow sites, temporarily disturbed areas will be restored to the natural community present prior to disturbance. Cultivated lands that are used for borrow and RTM sites and cannot be restored to cultivated lands following disturbance, because of topographic alteration, may be restored as grasslands.

The natural communities that are restored in temporarily disturbed areas may count toward the protection requirements under Environmental Commitment 3 if the areas meet the siting and design criteria and other requirements referred to under Environmental Commitment 3.

***Explanation of effectiveness:***

Implementation of the proposed project would result in permanent and temporary impacts on natural communities. Implementation of restoration and protection activities, and AMM10 together with AMM1–AMM7 would reduce the adverse effects that could result from project activities. The restoration and monitoring plans for implementation of AMM10 would involve methods for stockpiling, storing, and restoring topsoil, revegetating disturbed areas, monitoring and maintenance schedules, adaptive management strategies, reporting requirements, and success criteria. AMM10 would also include planting native species appropriate for the natural community being restored, with the exception of some borrow sites in cultivated lands that would be restored as grasslands. This, in addition to other restoration activities, protection, and AMMs, would reduce and offset impacts to a less than significant level.

In the absence of the implementation of this avoidance and minimization measure, CMs, and other AMMs, there would be a greater potential for significant impacts on biological resources. Refer to the impact analyses for each resource for more detail.

### **3B.4.11 AMM11 Covered Plant Species**

A complete botanical survey of project sites in areas of suitable habitat for special-status plants will be completed using *Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Plants* (U.S. Fish and Wildlife Service 1996) and *Protocols for Surveying and Evaluating Impacts to Special Status Native Plant Populations and Natural Communities* (California Department of Fish and Game 2009). The surveys will be floristic in nature and conducted in a manner that maximizes the likelihood of locating special-status plant species or special-status natural communities that may be present (i.e., during the appropriate season and at an appropriate level of ground coverage).

Special-status plant surveys required for project-specific permit compliance will be conducted during the planning phase to allow design of the individual project activities to avoid or minimize adverse impacts to habitat for specified covered plants. The purpose of these surveys will be to verify that the locations of special-status plants identified in previous record searches or surveys are extant, identify any new special-status plant occurrences, and cover any portions of the project area not previously identified. The extent of mitigation of direct loss of or indirect effects on special-status plants will be based on these survey results. Locations of special-status plants in proposed construction areas will be recorded using a GPS unit and flagged.

The following measures will be implemented.

- Design restoration projects to avoid the direct, temporary loss of occupied habitat from construction activities for delta button celery, slough thistle, and Suisun thistle. If delta button celery or slough thistle occurs in a floodplain restoration area, restoration projects may be designed to include occupied habitat in the restored floodplain provided ground disturbance is avoided in the occupied habitat and the restoration is designed such that the anticipated level of flooding and scouring is compatible with the life-history needs of the covered plant species. In tidal restoration areas, Suisun thistle occurrences may experience the indirect effect of tidal

damping. This effect will be monitored and adaptively managed to ensure the occurrence is protected from loss.

- Avoid modeled habitat for vernal pool plants to the maximum extent practicable. Where practicable, no ground-disturbing activities or alterations to hydrology will occur within 250 feet of vernal pools. As identified in AMM12, DWR will ensure that there will be no adverse modification of critical habitat for vernal pool plants. No more than 10 wetted acres of vernal pools will be removed as a result of covered activities throughout the permit term.
- Avoid the loss of extant occurrences of all covered plant species with the exception of the loss of one occurrence of Heckard's peppergrass and the potential temporal loss of the four intertidal plant species: Mason's lileopsis, Suisun marsh aster, Delta tule pea, and delta mudwort.
- If an occurrence has more than 10 individuals, no more than 5% of the total number of individuals in the occurrence will be removed. If an occurrence has 10 or fewer individuals, all individuals may be removed. Loss of individuals for all occurrences will be offset through replacement of occupied habitat at a ratio of at least 1:1, to achieve no net loss of occupied habitat. These requirements do not pertain to Suisun thistle, slough thistle, and delta button celery, for which no individuals may be removed (see above). For the BDCP alternatives, these requirements also do not apply to the historical occurrence of Heckard's peppergrass in Hass Slough (CNDDB Element Occurrence number 7; California Department of Fish and Wildlife 2013); take of this occurrence by tidal restoration (CM4), while not expected, is allowed for the BDCP alternatives (BDCP Chapter 5, *Effects Analysis*, Table 5.6-19).
- To minimize the spread of nonnative, invasive plant species from restoration sites, DWR will retain a qualified botanist or weed scientist prior to clearing operations to determine if affected areas contain invasive plants. If areas to be cleared contain invasive plants, then chipped vegetation material from those areas will not be used for erosion control; in these cases the material will be disposed of to minimize the spread of invasive plant propagules (e.g., burning, composting).
- To minimize the introduction of invasive plant species, construction vehicles and construction machinery will be cleaned prior to entering construction sites that are in or adjacent to natural communities other than cultivated lands, and prior to entering any project restoration sites or conservation lands other than cultivated lands. Vehicles working in or travelling off paved roads through areas with infestations of invasive plant species will be cleaned before travelling to other parts of the Plan Area. Cleaning stations will be established at the perimeter of covered activities along construction routes as well as at the entrance to conservation lands. Biological monitoring will include locating and mapping locations of invasive plant species within the construction areas during the construction phase and the restoration phase. Infestations of invasive plant species will be targeted for control or eradication as part of the restoration and revegetation of temporarily disturbed construction areas.

This avoidance and minimization measure does not apply to the routine management, maintenance, and educational activities of DWR and its partners in the reserve system. DWR will determine during implementation the most effective and cost-efficient means to minimize the unintentional spread of invasive plants through vehicle travel.

During the planning phase, DWR will ensure that activities in designated critical habitat areas for Suisun thistle or soft bird's-beak (see BDCP Appendix 3.C, Figure 3.C-6 and Figure 3.C-7), if any, will not result in the adverse modification of any of the primary constituent elements for Suisun thistle

or soft bird's-beak critical habitat. The CDFW Suisun Marsh Unit tracks both of these species (GIS-mapped) in Suisun. No covered activities will take place within designated Suisun thistle or soft bird's-beak critical habitat areas without prior written concurrence from USFWS that such activities will not adversely modify any primary constituent elements of Suisun thistle or soft bird's-beak critical habitat.

Primary constituent elements for Suisun thistle are defined as follows.

- Persistent emergent, intertidal, estuarine wetland at or above the mean high water mark as extended directly across any intersecting channels).
- Open channels that periodically contain moving water with ocean-derived salts in excess of 0.5%.
- Gaps in surrounding vegetation to allow for seed germination and growth.

Primary constituent elements for soft bird's-beak are defined as follows.

- Persistent emergent, intertidal, estuarine wetland at or above the mean high water mark (as extended directly across any intersecting channels).
- Rarity or absence of plants that naturally die in late spring (winter annuals).
- Partially open spring canopy cover [i.e., photosynthetic photo flux density of approximately 790 nanomoles per square meter per second ( nMol/m<sup>2</sup>/s)] at ground level, with many small openings to facilitate seedling germination.

For the BDCP alternatives, also see AMM37 for measures to avoid and minimize recreation-related effects on the following species: brittlescale, Carquinez goldenbush, delta button celery, heartscale, San Joaquin spearscale, and all vernal pool plant species.

***Explanation of effectiveness:*** The implementation of AMM11 will ensure that restoration projects avoid and minimize effects on populations of the special-status plants listed above. AMM11 will ensure that direct impacts on Suisun thistle, slough thistle, and delta button celery populations are completely avoided. It also will contribute to identifying and protecting other populations of special-status plants, and minimize the spread of invasive plant species that could affect these populations.

In absence of the implementation of AMM11, protection measures, AMM1–AMM6, and AMM10, there would be a greater potential for significant impacts on special-status plants. Refer to the impact analyses for special-status plant species for more detail.

### 3B.4.12 AMM12 Vernal Pool Crustaceans

Vernal pool crustacean critical habitat is present in the Plan Area in Conservation Zones 1, 8, and 11. During the planning phase for individual projects, DWR will ensure that tidal natural communities restoration or other ground-disturbing project activities in Conservation Zones 1 and 11 will not result in the adverse modification of primary constituent elements of critical habitat for vernal pool fairy shrimp, conservancy fairy shrimp, and vernal pool tadpole shrimp as defined by USFWS (70 FR 46924–46998; also see BDCP Appendix 3.C, Figures 3.C-1, 3.C-2, and 3.C-3). These activities will occur at least 250 feet from vernal pool crustacean critical habitat containing the primary constituent elements defined below or some lesser distance, if it is determined through project review with concurrence from USFWS that the activities will not result in changes in hydrology or soil salinity that could adversely modify the primary constituent elements of vernal pool crustacean

critical habitat. No covered activities will take place within designated vernal pool crustacean critical habitat units without prior written concurrence from USFWS that such activities will not adversely modify any primary constituent elements of vernal pool crustacean critical habitat. For the BDCP Alternatives, also see AMM37 for measures to avoid and minimize recreation-related effects on these species.

Primary constituent elements for vernal pool fairy shrimp are defined as follows (70 FR 46924–46998).

- Topographic features characterized by mounds and swales and depressions within a matrix of surrounding uplands that result in complexes of continuously, or intermittently, flowing surface water in the swales connecting the pools described below, providing for dispersal and promoting hydroperiods of adequate length in the pools.
- Depressional features including isolated vernal pools with underlying restrictive soil layers that become inundated during winter rains and that continuously hold water for a minimum of 18 days, in all but the driest years, thereby providing adequate water for incubation, maturation, and reproduction. As these features are inundated on a seasonal basis, they do not promote the development of obligate wetland vegetation habitats typical of permanently flooded emergent wetlands.
- Sources of food, expected to be detritus occurring in the pools, contributed by overland flow from the pools' watershed, or the results of biological processes within the pools themselves, such as single-celled bacteria, algae, and dead organic matter, to provide for feeding.
- Structure within the pools described above, consisting of organic and inorganic materials, such as living and dead plants from plant species adapted to seasonally inundated environments, rocks, and other inorganic debris that may be washed, blown, or otherwise transported into the pools, that provide shelter.

Primary constituent elements for vernal pool tadpole shrimp are the same as above except the minimum period of inundation listed in the second bullet is 41 days instead of 18 days. Primary constituent elements for conservancy fairy shrimp are also the same as above except the minimum period of inundation listed in the second bullet is 19 days instead of 18 days.

During the planning phase, site-level assessments will be conducted and projects will be designed to avoid modeled habitat for vernal pool crustaceans to the maximum extent practicable. Where practicable, the project will be planned and designed to ensure no ground-disturbing activities or alterations to hydrology will occur within 250 feet of vernal pool crustacean habitat. As identified above, DWR will ensure that there will be no adverse modification of critical habitat for vernal pool crustaceans.

If covered activities are to occur in core recovery areas, protocol-level surveys for vernal pool crustaceans will be conducted to determine whether listed branchiopods are present. Surveys will be conducted according to the most recent USFWS guidelines by qualified biologists with the appropriate recovery permit under Section 10(a)(1)(A) of the Endangered Species Act. If conservancy or longhorn fairy shrimps are detected in core recovery areas, projects will be redesigned to ensure that no suitable habitat within these areas is adversely affected, due to the rarity of these species.

Projects will be designed to avoid direct and indirect effects on vernal pool crustacean habitat to the extent possible. No more than 10 wetted acres of vernal pool crustacean habitat will be removed

throughout the permit term (this cap applies to both temporary and permanent loss). No more than 20 wetted acres will be indirectly affected by covered activities (a vernal pool is considered indirectly affected if activities that could cause hydrologic or other alternations to a pool occur within 250 feet of the vernal pool). Where construction occurs within 250 feet of vernal pool crustacean habitat, construction BMPs (AMM2) will be implemented to ensure that construction activities minimize effects on the habitat. Protective fencing will be installed around vernal pool crustacean habitat with signage identifying these areas as containing sensitive biological resources. A biological monitor will ensure that fencing and BMPs are maintained for the duration of construction and that construction personnel are provided the necessary worker awareness training (AMM1).

**Explanation of effectiveness:** The implementation of AMM12 would ensure that the construction of the water conveyance facilities, restoration activities, and operations and maintenance avoid and minimize effects on habitat for vernal pool crustaceans that occurs adjacent to project areas. AMM12 provides a process for selecting and designing restoration sites so that they avoid and minimize direct and indirect effects on vernal pool crustacean habitat, and sets a maximum amount of wetted habitat that may be directly and indirectly affected. This AMM provides assurances that project-related activities with unknown locations are carefully designed to avoid and minimize the loss or modification of vernal pool crustacean habitat.

AMM12 will also serve to avoid and minimize effects on other vernal pool species, such nonlisted vernal pool invertebrates, special-status vernal pool plants, and California tiger salamander.

In absence of the implementation of AMM12, restoration and protection measures, AMM1–AMM6, and AMM10, there would be a greater potential for significant impacts on vernal pool species due to loss of or modification of habitat and take of individuals from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### 3B.4.13 AMM13 California Tiger Salamander

Designated critical habitat for California tiger salamander is present in in the Plan Area along the western edge of Conservation Zone 1. This critical habitat unit (Central Population of California Tiger Salamander Central Valley Region, Unit 2) extends along the west side of State Route 113 from the short east-west portion of State Route 113 south of Hay Road on the north to Creed Road on the south (see BDCP Appendix 3.C, Figure 3.C-4). During the planning phase for individual restoration projects, DWR will ensure that tidal natural communities restoration along Lindsey Slough and other project activities near Jepson Prairie will not result in the adverse modification of critical habitat for California tiger salamander in this area. The only construction activities that will affect California tiger salamander critical habitat are those related to restoration projects; construction of the water conveyance facilities will not affect critical habitat for this species. These activities, if planned for areas within designated critical habitat areas, will be designed to avoid adverse modification of the primary constituent elements for the species as defined by USFWS (70 FR 49379–49458). For the BDCP alternatives, also see AMM37 for measures to avoid and minimize recreation-related effects on this species.

Tidal restoration and other project activities will occur at least 250 feet from California tiger salamander critical habitat containing the primary constituent elements defined below. A lesser distance is allowed if it is determined through project review and concurrence by USFWS that tidal restoration actions will not result in changes in hydrology or soil salinity that could adversely



1 modify the primary constituent elements of California tiger salamander critical habitat. No covered  
 2 activities will take place within designated California tiger salamander critical habitat areas without  
 3 prior written concurrence from USFWS that such activities will not adversely modify any primary  
 4 constituent elements of California tiger salamander critical habitat. Primary constituent elements  
 5 for California tiger salamander are defined as follows (70 FR 49379–49458).

- 6 • Standing bodies of fresh water, including natural and human-made (e.g., stock) ponds, vernal  
 7 pools, and other ephemeral or permanent water bodies that typically support inundation during  
 8 winter rains and hold water for a minimum of 12 weeks in a year of average rainfall.
- 9 • Upland habitats adjacent and accessible to and from breeding ponds that contain small mammal  
 10 burrows or other underground habitat that California tiger salamander depend upon for food,  
 11 shelter, and protection from the elements and predation.
- 12 • Accessible upland dispersal habitat between occupied locations that allow for movement  
 13 between such sites.

14 During the planning phase, aquatic habitats in potential work areas will be surveyed (nonprotocol)  
 15 for California tiger salamander larvae and eggs. If California tiger salamander larvae or eggs are  
 16 found, the project will be designed to avoid and minimize impacts on the aquatic habitat and these  
 17 life stages. If the aquatic habitat cannot be avoided, USFWS and CDFW will be contacted and, if  
 18 determined to be appropriate, measures will be developed to relocate larvae or eggs to the nearest  
 19 suitable aquatic habitat, as determined by the USFWS- and CDFW-approved biologist.

20 AMMs for California tiger salamanders will only be required for projects occurring within suitable  
 21 habitat as identified from the habitat modeling and by additional assessments conducted during the  
 22 planning phase of construction or restoration projects. A qualified biologist familiar with the species  
 23 and its habitat will conduct a field evaluation of suitable upland or aquatic habitat for California tiger  
 24 salamander for all covered activities that occur within modeled habitat. Because California tiger  
 25 salamanders are assumed to only occupy limited to areas of suitable habitat in the Plan Area, USFWS  
 26 protocol-level surveys to determine presence are not necessary.

27 If the project does not fully avoid effects on suitable habitat, the following measures will be  
 28 implemented.

- 29 • To the extent feasible, construction activities occurring within suitable upland habitat that is  
 30 within 1.3 miles of California tiger salamander aquatic habitat will be restricted to the dry  
 31 season, July 15 through October 15 (the period can be extended depending on the onset or  
 32 cessation of rains), to avoid the period when they are most likely to be moving through upland  
 33 areas. If construction activities must occur within suitable tiger salamander habitat during the  
 34 wet season, such construction will avoid all suitable aquatic habitat. No construction activities  
 35 will be conducted in upland habitat areas where tiger salamanders may occur if there is a  
 36 greater than 70% chance of rain based on the National Oceanic and Atmospheric  
 37 Administration's National Weather Service forecast or within 48 hours following a rain event  
 38 greater than 0.25 inch, unless approved by the monitor. To the extent feasible, earthmoving and  
 39 construction activities will cease no less than 30 minutes before sunset and will not begin again  
 40 until no less than 30 minutes after sunrise. Except when necessary for driver or pedestrian  
 41 safety, artificial lighting at a worksite will be prohibited during the hours of darkness. Where  
 42 lighting is necessary, lighting will be directed inwards towards the construction footprint and  
 43 will not be cast on California tiger salamander habitat outside of the construction area.

- 1       ● A USFWS- and CDFW-approved biologist will determine where exclusion fencing will be  
2       installed to protect California tiger salamander habitat adjacent to the defined project footprint  
3       and to minimize the potential for California tiger salamanders to enter the construction work  
4       area. The perimeter of construction sites will be fenced with amphibian exclusion fencing by  
5       October 15. The California tiger salamander exclusion fencing will be shown on the final  
6       construction plans. Where construction access is necessary, gates will be installed with the  
7       exclusion fence.
  - 8       ● Pipes or similar structures will be capped if stored overnight. Excavated holes and trenches will  
9       have escape ramps, and any open holes and trenches will be closed with plywood at the end of  
10      each work day. The biological monitor and construction foreman will be responsible for  
11      checking the exclusion fencing around the work areas daily to ensure that they are intact and  
12      upright. This will be especially critical during rain events, when flowing water can easily  
13      dislodge the fencing. Any necessary repairs will be immediately addressed. The amphibian  
14      exclusion fencing will remain in place for the duration of construction.
  - 15      ● If the fence is compromised during the rainy season, when California tiger salamanders are  
16      likely to be active, a survey will be conducted immediately preceding construction activity that  
17      occurs in designated tiger salamander habitat or in advance of any activity that may result in  
18      take of the species. The biologist will search along exclusion fences and in pipes and beneath  
19      vehicles each morning before they are moved. The survey will include a careful inspection of all  
20      potential hiding spots, such as along exclusion fencing, large downed woody debris, the  
21      perimeter of ponds, wetlands, and riparian areas. Any tiger salamanders found will be captured  
22      and relocated to suitable habitat a minimum of 300 feet outside of the work area that has been  
23      identified by a qualified biologist and approved by the wildlife agencies prior to commencement  
24      of construction.
  - 25      ● Surface-disturbing activities will be designed to minimize or eliminate effects on rodent  
26      burrows that may provide suitable aestivation habitat. Areas with a high concentration of  
27      burrows will be avoided by surface-disturbing activities to the maximum extent practicable. In  
28      addition, when a concentration of burrows is present in a project site, the area will be staked or  
29      flagged to ensure that work crews are aware of their location and to facilitate avoidance of the  
30      area.
- 31      Preconstruction surveys will be implemented after the project planning phase and prior to any  
32      ground-disturbing activity.
- 33      ● No more than 1 week prior to any ground disturbance that could affect potential California tiger  
34      salamander habitat, preconstruction surveys for California tiger salamander will be conducted  
35      by a USFWS- and CDFW-approved biologist. These surveys will consist of walking surveys of the  
36      project limits. The USFWS-approved biologists will investigate potential California tiger  
37      salamander cover sites and aquatic habitats, if present. All mammal burrows within the project  
38      limits that cannot be avoided will be hand-excavated and collapsed.
  - 39      ● Any California tiger salamander adult found will be captured and immediately relocated to  
40      suitable habitat a minimum of 300 feet outside of the work area and predetermined prior to  
41      commencement of construction. Prior to and after handling salamanders, the biologist will  
42      observe the appropriate decontamination procedures to prevent the spread of chytrid fungus or  
43      other pathogens.

**Explanation of effectiveness:** AMM13 demonstrates the project's intent to avoid and minimize effects on the species and its habitat to the maximum extent feasible. The inclusion of preconstruction surveys and monitoring ensures that take of individuals is avoided or minimized and provides opportunities to modify project construction to limit the potential for take. These measures also recommend restrictions on construction activities to avoid the potential for harming and harassing individuals. The measure ensures the selection of project sites that avoid and minimize effects on the species and its habitat, including critical habitat in the area of Jepson Prairie.

In absence of the implementation of AMM13, AMM1–AMM6, AMM10, AMM37, and restoration and protection measures, there would be a greater potential for significant impacts on this species due to loss of habitat and take of individuals from construction and/or operation of the proposed project. Refer to the impact analyses for this species for more detail.

### 3B.4.14 AMM14 California Red-Legged Frog

Designated critical habitat for the California red-legged frog overlaps with portions of Conservation Zones 8 and 11 (see BDCP Appendix 3.C, Figure 3.C-5). The construction footprint is outside of this critical habitat for California red-legged frog but restoration and protection activities could take place in these areas. During the planning phase, for restoration and protection actions, DWR will ensure that covered activities avoid designated critical habitat areas, or if such habitat cannot be avoided, the covered activities will not result in the adverse modification of the primary constituent elements of critical habitat for California red-legged frog. No covered activities will take place within designated California red-legged frog critical habitat areas without prior written concurrence from USFWS that such activities will not adversely modify any primary constituent elements of California red-legged frog critical habitat. For the BDCP alternatives, also see AMM37 for measures to avoid and minimize recreation-related effects on this species.

Primary constituent elements for California red-legged frog are defined as follows (75 FR 12816–12959).

- **Aquatic breeding habitat.** Standing bodies of fresh water (with salinities less than 4.5 parts per thousand), including natural and human-made (e.g., stock) ponds, slow-moving streams or pools within streams, and other ephemeral or permanent water bodies that typically become inundated during winter rains and hold water for a minimum of 20 weeks in all but the driest of years.
- **Aquatic nonbreeding habitat.** Freshwater pond and stream habitat, as described above, that may not hold water long enough for the species to complete its aquatic life cycle but which provide for shelter, foraging, predator avoidance, and aquatic dispersal of juvenile and adult California red-legged frogs. Other wetland habitats considered to meet these criteria include, but are not limited to, plunge pools within intermittent creeks, seeps, quiet water refugia within streams during high water flows, and springs of sufficient flow to withstand short-term dry periods.
- **Upland habitat.** Upland areas adjacent to or surrounding breeding and nonbreeding aquatic and riparian habitat up to a distance of 1 mile in most cases (i.e., depending on surrounding landscape and dispersal barriers) including various vegetation types such as grassland, woodland, forest, wetland, or riparian areas that provide shelter, forage, and predator avoidance for the California red-legged frog. Upland features are also essential in that they are needed to maintain the hydrologic, geographic, topographic, ecological, and edaphic features that support

and surround the aquatic, wetland, or riparian habitat. These upland features contribute to filling of aquatic, wetland, or riparian habitats; maintaining suitable periods of pool inundation for larval frogs and their food sources; and providing nonbreeding, feeding, and sheltering habitat for juvenile and adult frogs (e.g., shelter, shade, moisture, cooler temperatures, a prey base, foraging opportunities, and areas for predator avoidance). Upland habitat should include structural features such as boulders, rocks, and organic debris (e.g., downed trees, logs, small mammal burrows, or moist leaf litter).

- **Dispersal habitat.** Accessible upland or riparian habitat within and between occupied or previously occupied sites that are located within 1 mile of each other, and that support movement between such sites (i.e., uplands that provide habitat connectivity between two or more aquatic habitat areas). Dispersal habitat includes various natural habitats, and altered habitats such as agricultural fields, that do not contain barriers (e.g., heavily traveled roads without bridges or culverts) to dispersal. Dispersal habitat does not include moderate- to high-density urban or industrial developments with large expanses of asphalt or concrete, nor does it include large lakes or reservoirs over 50 acres in size, or other areas that do not contain those features identified in the other primary constituent elements described above as essential to the conservation of the species.

During the planning phase, appropriate buffer distances will be established around aquatic habitat to minimize direct and indirect effects on California red-legged frog. If aquatic habitat cannot be avoided, aquatic habitats in potential work areas will be surveyed (nonprotocol) for tadpoles and egg masses. If California red-legged frog tadpoles or egg masses are found, and the aquatic habitat cannot be avoided, USFWS and CDFW will be contacted, and if determined to be appropriate, measures will be developed to relocate tadpoles and eggs to the nearest suitable aquatic habitat, as determined by the USFWS- and CDFW-approved biologist

AMMs for California red-legged frogs will only be required for projects occurring within suitable habitat as identified from the habitat modeling and by additional assessments conducted during the planning phase of construction or restoration projects. A qualified biologist will conduct a field evaluation of suitable upland or aquatic habitat for California red-legged frogs for all covered activities that occur within modeled habitat. Surveys within modeled upland habitat will involve identifying suitable aquatic features that may not have been identified during the habitat modeling because the mapping unit was too small. Because California red-legged frogs are assumed to only occupy suitable habitat in the Plan Area, USFWS protocol-level surveys to determine presence are not necessary.

If the project does not fully avoid effects on suitable habitat, the following measures will be required.

- To the extent feasible, initial ground-disturbing activities will not be conducted between November 1 and March 31 in areas identified during the planning stages as providing potential California red-legged frog habitat to avoid the period when they are most likely to be moving through upland areas. When ground-disturbing activities must take place between November 1 and March 31, USFWS-approved biological monitor will conduct daily monitoring for California red-legged frog.
- To the maximum extent feasible, nighttime construction will be minimized or avoided by DWR, as project applicant, when working in suitable California red-legged frog habitat. Because dusk and dawn are often the times when the California red-legged frog is most actively moving and foraging, to the greatest extent practicable, earthmoving and construction activities will cease

no less than 30 minutes before sunset and will not begin again prior to no less than 30 minutes after sunrise. Except when necessary for driver or pedestrian safety artificial lighting at a worksite will be prohibited during the hours of darkness when working in suitable California red-legged frog habitat.

- Disturbance to suitable aquatic and upland sites within or near the project footprint will be avoided to the extent feasible, and the loss of aquatic habitat and grassland vegetation will be minimized through adjustments in project design, as practicable.
- A USFWS-approved biologist will determine where exclusion fencing will be installed to protect California red-legged frog habitat adjacent to the defined project footprint and to minimize the potential for California red-legged frogs to enter the construction work area. The perimeter of construction sites will be fenced with amphibian exclusion fencing by November 1. The California red-legged frog exclusion fencing will be shown on the final construction plans. Where construction access is necessary, gates will be installed with the exclusion fence.
- The biological monitor and construction foreman will be responsible for checking the exclusion fencing around the work areas daily to ensure that they are intact and upright. This will be especially critical during rain events, when flowing water can easily dislodge the fencing. Any necessary repairs will be immediately addressed. The amphibian exclusion fencing will remain in place for the duration of construction.
- If the exclusion fence is found to be compromised at any time, a survey will be conducted immediately preceding construction activity that occurs in designated California red-legged frog habitat or in advance of any activity that may result in take of the species. The biologist will search along exclusion fences and in pipes and beneath vehicles before they are moved. The survey will include a careful inspection of all potential hiding spots, such as along exclusion fencing, large downed woody debris, the perimeter of ponds, wetlands, and riparian areas. Any California red-legged frogs found will be captured and relocated to suitable habitat a minimum of 300 feet outside of the work area that has been identified by a qualified biologist and approved by the wildlife agencies prior to commencement of construction.
- Surface-disturbing activities will be designed to minimize or eliminate effects on rodent burrows that may provide suitable cover habitat for California red-legged frog. Areas with a high concentration of burrows will be avoided by surface-disturbing activities to the maximum extent practicable. In addition, when a concentration of burrows is present in a project site, the area will be staked or flagged to ensure that work crews are aware of their location and to facilitate avoidance of the area.

Preconstruction surveys will be implemented after the project planning phase and prior to any ground-disturbing activity.

- No more than 1 week prior to any ground disturbance that could affect potential California red-legged frog habitat, preconstruction surveys for California red-legged frog will be conducted by a USFWS- and CDFW-approved biologist. These surveys will consist of walking the project limits. The USFWS-approved biologists will investigate potential California red-legged frog cover sites and aquatic habitats, if present. All mammal burrows that cannot be avoided will be hand-excavated and collapsed.
- Aquatic habitats in work areas will be surveyed (nonprotocol) for California red-legged frog adults and metamorphs. Any California red-legged frog adults or metamorphs found will be captured and held for a minimum amount of time necessary to relocate the animal to suitable

habitat a minimum of 300 feet outside of the work area. Prior to and after handling frogs, the biologist will observe the appropriate decontamination procedures to ensure against spread of chytrid fungus or other pathogens.

- If construction activities will occur in streams, temporary aquatic barriers such as hardware cloth will be installed both up and downstream of the stream crossing, and animals will be relocated and excluded from the work area. The qualified USFWS-approved biologists will establish an adequate buffer on both sides of creeks and around potential aquatic habitat and will restrict entry during the construction period.

**Explanation of effectiveness:** AMM14 demonstrates the project's intent to avoid and minimize effects on the species and its habitat to the maximum extent feasible. The inclusion of preconstruction surveys and monitoring ensures that take of individuals is avoided or minimized and provides opportunities to modify project construction to limit the potential for take. These measures also recommend restrictions on construction activities to avoid the potential for harming and harassing individuals.

In absence of the implementation of AMM14, AMM 1–6, AMM10, and restoration and protection measures, there would be a greater potential for significant impacts on this species due to loss of habitat and take of individuals from construction and/or operation of the proposed project. Refer to the impact analyses for this species for more detail.

### 3B.4.15 AMM15 Valley Elderberry Longhorn Beetle

During the preconstruction planning phase, surveys for elderberry shrubs will be conducted in project areas with suitable habitat by a qualified biologist familiar with the appearance of valley elderberry longhorn beetle exit holes in elderberry shrubs. Elderberry shrubs will be avoided to the maximum extent practicable. Complete avoidance (i.e., no adverse effects) may be assumed when a buffer of at least a 100 feet is established and maintained around elderberry plants containing stems measuring 1 inch or greater in diameter at ground level.

Elderberry shrubs identified within project footprints that cannot be avoided will be transplanted to previously approved conservation areas in the Plan Area. Transplanting and associated compensation will follow the guidance outlined in USFWS's *Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (U.S. Fish and Wildlife Service 1999). These guidelines also identify ratios of elderberry seedlings and associated native vegetation to plant in conservation areas depending on shrub stem counts and sizes, and landscape position (riparian or savannah).

For shrubs not directly affected by construction but that occur within 100 feet of ground-disturbing activities, the following measures will be implemented.

- Fence and flag all areas to be avoided during construction activities. In areas where encroachment on the 100-foot buffer has been approved by USFWS, provide a minimum setback of at least 20 feet from the dripline of each elderberry plant.
- Brief contractors on the need to avoid damaging the elderberry plants and the possible penalties for not complying with these requirements.
- Erect signs every 50 feet along the edge of the avoidance area with the following information: "This area is habitat of the valley elderberry longhorn beetle, a threatened species, and must not be disturbed. This species is protected by the Endangered Species Act of 1973, as amended.

Violators are subject to prosecution, fines, and imprisonment.” The signs should be clearly readable from a distance of 20 feet, and must be maintained for the duration of construction.

- Instruct work crews about the status of the beetle and the need to protect its elderberry host plant.

***Explanation of effectiveness:*** The proposed project would result in permanent and temporary impacts on modeled habitat for valley elderberry longhorn beetle in the study area. These impacts would be offset through the implementation of CMs and AMMs, including AMM15, which requires surveys for elderberry shrubs within 100 feet of any ground disturbing activities, the implementation avoidance and minimize measures for any shrubs that are identified within this 100-foot buffer, and transplanting shrubs that can’t be avoided. All of these AMMs include elements that avoid or minimize the risk of affecting habitats and species adjacent to work areas and RTM storage sites. These commitments, implemented together with the AMMs, are more than sufficient to support the conclusion that the near-term impacts of the proposed project would be less than significant under CEQA.

In absence of the implementation of AMM15, AMM1–AMM6, AMM10, and habitat restoration and protection measures, there would be a greater potential for significant impacts on this species due to loss of habitat and take of individuals from construction and/or operation of the proposed project. Refer to the impact analyses for this species for more detail.

### 3B.4.16 AMM16 Giant Garter Snake

AMMs for giant garter snakes will only be required for projects and operations and maintenance activities occurring within suitable habitat as identified from the habitat modeling and by additional assessments conducted during the planning phase of construction or restoration projects. A qualified biologist familiar with the species’ habitat requirements will conduct a field evaluation of suitable upland or aquatic habitat for giant garter snake for all covered activities that occur within modeled habitat. The biologist will identify any aquatic features within modeled habitat that may have been missed during the modeling effort.

If the project or operation and maintenance activity does not fully avoid effects on suitable habitat, the following measures will be required.

- Disturbance to suitable aquatic and upland sites in or near the project footprint will be avoided to the extent feasible, and the loss of aquatic habitat and grassland vegetation will be minimized through adjustments to project design, as practicable.
- To the extent practicable, construction activities will be avoided within 200 feet of the banks of giant garter snake aquatic habitat, particularly in areas with a moderate to high likelihood of giant garter snake occurrence. Ground disturbance will be confined to the minimal area necessary to facilitate construction activities. Giant garter snake habitat will be clearly designated with construction fencing and signage identifying these areas as sensitive.
- A USFWS-approved biologist will determine where exclusion fencing will be installed to protect giant garter snake habitat adjacent to the defined project footprint and to minimize the potential for giant garter snakes to enter the construction work area. The perimeter of construction sites will be fenced with giant garter snake exclusion fencing between May 1 and September 1 (well in advance of snakes seeking overwintering refugia). The giant garter snake exclusion fencing

will be shown on the final construction plans. Where construction access is necessary, gates will be installed with the exclusion fence.

- The biological monitor and construction foreman will be responsible for checking the exclusion fencing around the work areas daily to ensure that they are intact and upright. This will be especially critical during rain events, when flowing water can easily dislodge the fencing. Any necessary repairs will be immediately addressed. The giant garter snake exclusion fencing will remain in place for the duration of construction
- If exclusion fencing is found to be compromised, a survey will be conducted immediately preceding construction activity that occurs in designated giant garter snake habitat or in advance of any activity that may result in take of the species. The biologist will search along exclusion fences and in pipes and beneath vehicles before they are moved. Any giant garter snake found will be captured and relocated to suitable habitat a minimum of 200 feet outside of the work area in a location that is identified by a qualified biologist and approved by USFWS and CDFW prior to commencement of construction.
- Preconstruction surveys will be implemented after the project planning phase and prior to any ground-disturbing activity.

***Explanation of effectiveness:*** The proposed project would result in permanent and temporary impacts on modeled habitat for giant garter snake in the study area. Potential impacts on giant garter snakes could occur as a result of the loss or conversion of habitat for and direct mortality of giant garter snake during construction and operation of the conservation measures or environmental commitments. The implementation of AMM16, as well as AMM1–AMM7, AMM10, and AMM37, will avoid and minimize the potential for harm of giant garter snakes within the project footprint through the preconstruction surveys, exclusion fencing, monitoring, and the intent to minimize ground-disturbing activities within 200 feet of aquatic habitat. With these AMMs, the project would avoid and minimize the potential for significant impacts on giant garter snakes, either indirectly or through habitat modifications.

In absence of the implementation of AMM16 other AMMs, and habitat restoration and protection measures, there would be a greater potential for significant impacts on this species due to loss of habitat and take of individuals from construction of the proposed project. Refer to the impact analyses for this species for more detail.

### **3B.4.17 AMM17 Western Pond Turtle**

AMMs for western pond turtle will only be required for projects occurring within or adjacent to suitable habitat as identified from the habitat modeling and by additional assessments conducted during the project planning phase. A qualified biologist will conduct a field evaluation of suitable upland or aquatic habitat for western pond turtles for all covered activities that occur within modeled habitat. See also AMM8 for measures related to dewatering aquatic areas.

If the project does not fully avoid effects on suitable habitat, the following measures will be required.

- The project proponent will retain a qualified wildlife biologist to conduct a preconstruction survey within 48 hours of disturbance in aquatic and riparian habitats to determine presence or absence of pond turtles in the construction work area.
- If possible, the surveys will be timed to coincide with the time of day and year when turtles are most likely to be basking and visible (during the cooler part of the day, 8:00 a.m. to 12:00 p.m.



during spring, summer, and late summer). Prior to conducting presence/absence surveys the biologist will locate the microhabitats for turtle basking (logs, rocks, brush thickets) and determine a location to quietly observe turtles.

- Each survey will include a 30-minute wait time after arriving onsite to allow startled turtles to return to open basking areas. The survey will consist of a minimum 15-minute observation time per area where turtles could be observed.
- If turtles are observed during a survey, they will be relocated outside of the construction area to appropriate aquatic habitat by a biologist with a valid memorandum of understanding from CDFW authorizing the capture and relocation of turtles and as determined during coordination with CDFW.
- If turtles are present within the project boundary for projects within 1 mile of Stone Lakes National Wildlife Refuge, the refuge manager will be contacted to determine if there is a location in the refuge where the refuge would like to relocate turtle. Turtles will then be captured with traps and relocated accordingly.

***Explanation of effectiveness:*** The proposed project would result in the loss or conversion of habitat for and direct mortality of western pond turtle, indirect effects of project implementation on western pond turtle, and periodic effects of inundation on western pond turtle. The habitat affected in the interior Delta (West Delta and South Delta) is of low value, consisting of levees and intensively farmed cultivated lands, while the Cache Slough and Cosumnes-Mokelumne ROAs are less intensively farmed and have higher-value habitat for the turtle. Because the estimates of the effect of tidal inundation are based on projections of where restoration may occur, actual effects are expected to be lower with implementation of AMM17, which would entail selecting sites to avoid or minimize the risk of affecting habitats and species adjacent to work areas and storage sites. In the absence of other conservation actions, the project would represent an adverse effect as a result of habitat modification and potential direct mortality of western pond turtle. However, with habitat protection and restoration associated with the conservation components, guided by landscape-scale goals and objectives and by AMM17, AMM1–AMM6, and AMM10, the effects of the project as a whole on western pond turtle would not be adverse. With implementation of AMM17, AMM1–AMM6, and AMM10, construction, operation, and maintenance of the project would avoid the potential for significant impacts on western pond turtles, either indirectly or through habitat modifications, and would not result in a substantial reduction in numbers or a restriction in the range of western pond turtles. Flooding of the Yolo Bypass and creation of seasonally inundated floodplain in various parts of the study area would periodically affect upland habitat for western pond turtle. Most of the increase in inundation would occur in the winter and early spring months, when western pond turtles may be in the water or overwintering and occupying upland habitats. With implementation of this and other AMMs, the project would not be expected to result in significant impacts on western pond turtle, either directly or through habitat modifications, because it would not result in a substantial reduction in numbers or a restriction in the range of western pond turtles.

In absence of the implementation of AMM17, AMM1–AMM6, AMM10, and restoration and protection, there would be a greater potential for significant impacts on this species due to loss of habitat and take of individuals from construction of the proposed project. Refer to the impact analyses for this resource for more detail.

## 3B.4.18 AMM18 Swainson's Hawk

### 3B.4.18.1 Preconstruction surveys

Preconstruction surveys will be conducted to identify the presence of active nest sites of tree-nesting raptors within 0.25 mile of project sites, staging and storage areas, construction access roads, work areas, and soil stockpile areas where accessible, by a qualified biologist with experience identifying Swainson's hawk. Transportation routes along public roads (roads leading to and from work areas) are considered disturbed, and no surveys or monitoring are required for nests along those roadways unless they are within ¼ mile of work areas. Surveys for nesting Swainson's hawks will be conducted to ensure nesting activity is documented prior to the onset of construction activity. Swainson's hawks nest in the Plan Area between approximately March 15 and September 15. While many nest sites are traditionally used for multiple years, new nest sites can be established in any year. Therefore, construction activity that is planned after March 15 of any year will require surveys during the year of the construction. If construction is planned before March 15 of any year, surveys will be conducted the year immediately prior to the year of construction. If construction is planned before March 15 of any year and subject to prior-year surveys, but is later postponed to after March 15, surveys will also be conducted during the year of construction.

The survey protocol established in Table 3B-9 is modified from the recommended timing and methodology for Swainson's hawk nesting surveys in the Central Valley (Swainson's Hawk Technical Advisory Committee 2000). This protocol will be used to detect active nests for Swainson's hawk unless the methodology is modified with written approval from CDFW. If active nests are found, appropriate avoidance and minimization measures will be implemented as described herein. If no activity is found, then construction can proceed with no restrictions until the following breeding season. Survey results will be provided to CDFW by phone or e-mail no less than 5 days prior to commencement of construction activities, and in a written report within 30 days after commencement of construction activities. The designated biologist will include the location of any known nest trees (occupied within one or more of the last five years) present within ¼ mile of the construction footprint.

Removal of known nest trees will be avoided to the maximum extent feasible. In the event that a nest tree (defined as a tree that has been used for nesting at least once in the last 3 years) needs to be removed for project related activities, CDFW will be notified in writing of the location of the nest tree and timing of removal. No trees with occupied nests will be removed until the nest is vacated. The tree replacement protocol described below will be followed to offset affected nest sites. This protocol may be modified with written CDFW authorization.

The designated biologist will survey potential Swainson's hawk nest trees and monitor occupied Swainson's hawk nests as described below. When proposed construction will occur within 0.25 mile of known nest trees, construction activities will be limited to outside the breeding season if feasible, or until the tree site is determined to be inactive.

Where construction activities cannot be restricted to more than 0.25 mile of an occupied nest site, activities will be restricted during the period of egg-laying to post-hatching to the extent feasible. If construction activities must occur in that time frame, construction will be initiated prior to egg-laying to the extent feasible. This will allow time for Swainson's hawks to acclimate to disturbance before eggs are laid, reducing the potential for abandonment. If construction activities must begin

after egg-laying is initiated, a 650-foot radius no-activity buffer will be established at least until eggs have hatched.

When construction activities will occur within 0.25 mile of an occupied Swainson's hawk nest, a 650-foot-radius nondisturbance buffer will be established around each occupied hawk nest tree. To the greatest extent feasible, no construction activity will be allowed to occur within the buffer while a Swainson's hawk nest is occupied. A nest is considered occupied from the time the nest is being constructed until the young leave the nest, or until the nesting attempt fails and the nest is abandoned. Occupied nests will be monitored to track progress of nesting activities. The buffer will be clearly delineated with fencing or other conspicuous marking. CDFW will be notified if construction activities must take place within 650 feet of an occupied nest site (tree), and additional protection measures will be implemented as described below.

Where construction will occur within 0.25 mile of an occupied Swainson's hawk nest tree, the following monitoring plan will be implemented. If project activities nesting bird monitoring and management plan is prepared by a designated biologist, and approved by CDFW, it will prevail where it differs from the measures below.

- Five days and three days prior to the initiation of construction at any site where a nest is within 0.25 mile of construction activities, a CDFW-approved biologist (designated biologist) will observe the subject nest(s) for at least 1 hour and until normal nesting behavior can be determined. Nest status will be determined and normal nesting behaviors documented, which may be used to compare to the hawks' activities once construction begins. The results of preconstruction monitoring will be reported to CDFW within 24 hours of completing each survey.
- Where a Swainson's hawk occupied nest occurs less than 325 feet from construction activities, the designated biologist will observe the nest periodically throughout the day where covered activities occur to ensure the hawks are engaged in normal nesting behavior.
- Where a Swainson's hawk occupied nest occurs between 325 to 650 feet from construction, the designated biologist will observe the nest for at least 2 hours per construction day where covered activities occur to ensure the hawks are involved with normal nesting behavior.
- Where a Swainson's hawk occupied nest occurs between 650 to 1,300 feet from construction, the designated biologist will observe the nest for at least 3 days per construction week to ensure the hawks are involved with normal nesting behavior and to check the status of the nest.

Physical contact with an active nest tree will be prohibited from the time of egg laying to fledging, unless CDFW consents in writing to the contact. Construction personnel outside of vehicles will be restricted to greater than 650 feet, or the length of the buffer approved in writing by CDFW, from the occupied nest tree unless construction activities require them to be closer.

All personnel will be out of the line of sight of the occupied nest during breaks if within 650 feet of the nest (as stated above, activities will only occur within 650 feet of a nest with written approval by CDFW).

If during construction the designated biologist determines that a nesting Swainson's hawk within 1/4 mile of the project is disturbed by project activities, to the point where there reproductive failure could occur, the designated biologist will immediately notify the Construction Supervisor and Program Environmental Manager. The Program Environmental Manager will contact CDFW, and it will be determined by the parties whether additional protection measures can be implemented.

Potential nest abandonment and failure may be indicated if Swainson's hawk exhibits distress and/or abnormal nesting behavior such as swooping/stooping at construction equipment or personnel, excessive vocalization [distress calls] or agitation directed at construction equipment or personnel, failure to remain on nest, or failure to deliver prey items for an extended time period. Additional protection measures will remain in place until the Swainson's hawk behavior has normalized. The designated biologist will notify CDFW if nests or nestlings are abandoned and if the nestlings are still alive to determine appropriate actions for salvaging the eggs or returning nestlings to the wild.

In addition to the measures described above, the following measures will also be implemented for activities for which the extent and location of the activity has not yet been fully planned.

- Geotechnical exploration activities will fully avoid Swainson's hawk nesting habitat.
- Geotechnical exploration will not be conducted within ¼ mile of an occupied Swainson's hawk nest.
- Transmission line activities will minimize loss of Swainson's hawk nesting habitat and will avoid occupied nests.

**Table 3B-9. Timing and Methodology for Swainson's Hawk Nesting Surveys**

Survey Dates	Survey Time	Number of Surveys	Methodology
First week of April	Sunrise to 12:00 p.m.; 4:00 p.m. to sunset	1	Position the surveyor at 50 to 200 feet from suitable nesting habitat with a clear view of trees and surrounding area. Scan all trees for a minimum of 2 hours within 0.25 mile of the project boundary. Observe perching, nest building, mating, courtship, and other prenesting behaviors to identify a nest or nesting activity area.
Second week of April	Sunrise to 12:00 p.m.; 4:00 p.m. to sunset	1	Repeat the above survey in areas not determined to be occupied during the first survey. Attempt to confirm nest locations within nesting activity areas.
Third week of April	Sunrise to 12:00 p.m.; 4:00 p.m. to sunset	1	Repeat the above survey in areas not determined to be occupied during the first and second survey. In cases where a nest site was not identified within a nesting activity area during the first two surveys, approach the nesting activity area carefully to locate nests. If a nest is not found where there is reasonable certainty of nesting activity, rely on observations of courtship, mating, nest building, and other behaviors to define a nesting area and establish a buffer.
June 10 through July 15	Sunrise to 12:00 p.m.; 4:00 p.m. to sunset	3 surveys spaced at least 3 days apart	Inspect all previously identified nests for activity status. Walk and scan all other suitable nest trees within 0.25 mile of the project boundary for nests not found during the initial survey.

### 3B.4.18.2 Nesting Habitat Replacement

The following measures will be implemented to minimize near-term effects on the Swainson's hawk populations that could otherwise result from loss of nesting habitat during the first 10 years of the permit term, before most of the restored riparian natural community has matured. Nesting habitat is limited throughout much of the Plan Area, consisting mainly of intermittent riparian, isolated trees, small groves, tree rows along field borders, roadside trees, and ornamental trees near rural residences. Removal of nest trees and nesting habitat could further reduce this limited resource and reduce or restrict the number of active Swainson's hawks within the Plan Area until restored riparian habitat is sufficiently developed. To account for this potential near-term loss of nesting habitat, the following additional measures will be implemented.

### 3B.4.18.3 Tree Replacement with Saplings

Planting trees as potential nesting habitat for Swainson's hawk is addressed in *CM7 Riparian Natural Community Restoration* and *CM11 Natural Communities Enhancement and Management*. While those measures address the overall long-term restoration of nesting habitat and the enhancement of conservation lands for this species, the following measures specifically address the removal of nest trees or nesting habitat during construction and provide a mechanism to compensate for this loss in order to minimize the near-term effects on Swainson's hawk populations.

- a) Five trees (5-gallon-container size) will be planted on conservation lands for every known and potential Swainson's hawk nest tree (20 feet or taller) removed by construction. Of the replacement trees planted, a variety of native tree species will be planted to provide trees with differing growth rates, maturation, and life span.
- b) Replacement trees will be planted with the mature trees to recreate nest sites, within conservation lands in areas that support high-value Swainson's hawk foraging habitat to increase nest sites, or within riparian plantings as a component of the requirement for riparian restoration where they are in close proximity to suitable foraging habitat. Replacement trees that are incorporated into the riparian restoration will not be clustered in a single region of the Plan Area, but will be distributed throughout the lands protected as foraging habitat for Swainson's hawk.

The survival success of the planted trees described in (a) and (b) above will be monitored annually for a period of 10 years to assure survival and appropriate growth and development. Success will be measured as an 80% survival rate at 5 and 10 years after planting. Plantings will subsequently be monitored every 5 years to verify their continued survival and growth. For every tree lost during the 10-year time period, a replacement tree will be planted immediately upon the detection of failure. All necessary planting requirements and maintenance (i.e., fertilizing, irrigation) to ensure success will be provided. Trees will be irrigated for a minimum of the first 5 years after planting, and then gradually weaned off the irrigation during a period of approximately 2 years. If larger stock is planted, the number of years of irrigation will be increased accordingly. If the 80% establishment success cannot be met, protection of three mature nest trees can substitute for each failed nest tree transplant.

### 3B.4.18.4 Tree Replacement with Mature Trees

To further and more directly minimize the effects of near-term loss of nesting habitat, a program to plant mature trees will be implemented. Planting larger, mature trees, including transplanting trees

1 scheduled for removal, and supplemented with additional saplings, is expected to accelerate the  
2 development of potential replacement nesting habitat.

- 3 a) To compensate for the temporal loss of available Swainson's hawk nest sites (defined as a 125-  
4 acre area where more than 50% of suitable nest trees (20 feet or taller) within the 125-acre  
5 block are removed) five mature native trees (at least 20 feet in height) will be transplanted to an  
6 appropriate location. Mature trees can be replaced with either nursery trees or trees scheduled  
7 to be removed by construction. To determine the number of replacement trees required, a grid  
8 of 125-acre blocks will be placed over each component of project footprint in which trees are to  
9 be removed, and the grid will be fixed in a manner that places the most complete squares of the  
10 grid in the project footprint (i.e., the grid will be adjusted so that, to the extent possible, entire  
11 squares rather than portions of squares will overlap with the project footprint).
- 12 b) The mature trees will be transplanted at a location that otherwise supports suitable habitat  
13 conditions for Swainson's hawk. This could be around project facilities (while taking into  
14 consideration potential effects of noise and visual disturbance from facility operation), on new  
15 conservation lands, existing conservation lands, or excess DWR land, as long as DWR controls  
16 the property. These trees will be transplanted as close as biologically feasible to the affected  
17 nest site (e.g., near the newly constructed intake facilities), unless such location would have low  
18 long-term conservation value due to factors such as threat of seasonal flooding or sea level rise,  
19 in which case the trees may be planted elsewhere on conservation lands.
- 20 c) DWR may substitute transplanting of mature nest trees with protection of three suitable nest  
21 trees for each mature nest tree that would be transplanted.
- 22 d) Replacement nest sites must be ½ mile or more apart and must be at least ½ mile from active  
23 nest trees.
- 24 e) As with the sapling trees, the mature replacement trees will be monitored and maintained for 10  
25 years to ensure survival and appropriate growth and development. Success will be measured  
26 using an 80% survival rate at 5 and 10 years after planting. In addition, 15 (5-gallon-container  
27 size) trees will be planted at each mature tree replacement site to provide longevity to the nest  
28 site. These 15 trees may be part of the trees committed to the project by item (a) included above  
29 as long they meet the survival criteria described in item (c) of Section 3B.4.18.3, *Tree*  
30 *Replacement with Saplings*.
- 31 f) Swainson's hawk foraging habitat will be protected within 3 miles of a known Swainson's hawk  
32 tree and within 50 miles of the project footprint on land not subject to threat of seasonal  
33 flooding, construction disturbances, or other conditions that would reduce the foraging value of  
34 the land.
- 35 g) To reduce temporal impacts resulting from the loss of mature nest trees, the plantings described  
36 above will occur prior to or concurrent with the loss of trees.

37 ***Explanation of effectiveness:*** The proposed project would result in the loss or conversion of habitat  
38 for and potential harm of Swainson's hawks. AMM18 would ensure that the project's potential for  
39 take is minimized by preconstruction surveys well in advance of construction, avoidance buffers,  
40 and monitoring to ensure that project activities do not disrupt nesting or result in take of Swainson's  
41 hawks.

42 The guidance for the replacement of nesting habitat in conjunction with the proposed riparian  
43 restoration and protection under *CM7 Riparian Natural Community Restoration* (Environmental

Commitment 7 for non-HCP alternatives) ensures that loss of nesting habitat is mitigated and that Swainson's hawk numbers in the project area do not diminish over the long-term. This portion of AMM18 would also serve to offset the loss of habitat for Cooper's hawk, osprey, cormorants, herons, and egrets.

In absence of the implementation of AMM18, AMM1–AMM6, AMM10, and habitat restoration and protection measures, there would be a greater potential for significant impacts on this species due to loss of habitat, take of individuals, and disruption of normal behaviors from construction and/or operation of the proposed project. Refer to the impact analyses for each species for more detail.

### **3B.4.19 AMM19 California Clapper Rail**

If construction or restoration activities are necessary during the breeding season, preconstruction surveys for California clapper rail will be conducted where suitable habitat for the species occurs within or adjacent to work areas where accessible. Surveys will be initiated sometime between January 15 and February 1. A minimum of four surveys will be conducted (two passive surveys followed by two active surveys). The survey dates will be spaced at least 2 weeks apart and will cover the time period from the date of the first survey through the end of March and mid-April. This will allow the surveys to encompass the time period when the highest frequency of calls is likely to occur. These surveys will involve the following protocol (based on U.S. Fish and Wildlife Service 2015), or other USFWS- and CDFW-approved survey methodologies that may be developed based on new information and evolving science, and will be conducted by biologists with the qualifications stipulated in the USFWS- or CDFW-approved methodologies.

- Survey stations will be established such that the entire marsh is covered by 250- to 300-foot radius circular plots where accessible. Listening stations (passive) and call playback (active) survey stations will be established no more than 650-feet apart along roads, trails, and levees that will be affected by covered activities.
- For passive surveys, an observer will be assigned to a listening station for the duration (2 hours) of each survey.
- For active surveys, an observer will be assigned to each survey station for 45 minutes. A total of 3 calls will be conducted at each playback/listening station spaced at 15 minutes apart.
- Surveys will proceed until clapper rail(s) are detected. Once a rail is detected, the project site is considered occupied and at that time, all surveys within the project site will be terminated.
- Sunrise surveys will begin 60 minutes before sunrise and conclude 75 minutes after sunrise (or until presence is detected).
- Sunset surveys will begin 75 minutes before sunset and conclude 60 minutes after sunset (or until presence is detected).
- Surveys will not be conducted when tides are greater than 4.5 National Geodetic Vertical Datum or when sloughs and marshes are more than bankfull.
- California clapper rail vocalizations will be recorded on a data sheet. A GPS receiver and compass will be used to identify survey stations, angles to call locations, and call locations and distances. The call type, location, distance, and time will be recorded on a data sheet.

The project will be implemented in a manner that will not result in take of California clapper rail as defined by Section 86 of the California Fish and Game Code. If California clapper rail is present in the immediate construction area, the following measures will apply during construction activities.

- To avoid the loss of individual California clapper rails, activities within or adjacent to the species' habitat will not occur within 2 hours before or after extreme high tides (6.5 feet or above, as measured at the Golden Gate Bridge), when the marsh plain is inundated. During high tide, protective cover for California clapper rail is sometimes limited, and activities could prevent them from reaching available cover.
- To avoid the loss of individual California clapper rails, activities within or adjacent to tidal marsh areas will be avoided during the rail breeding season (February 1 – August 31), unless surveys are conducted to determine rail locations and territories can be avoided.
- If breeding California clapper rails are determined to be present, activities will not occur within 500 feet of an identified calling center (or a smaller distance if approved by USFWS and CDFW). If the intervening distance is across a major slough channel or across a substantial barrier between the rail calling center and any activity area is greater than 200 feet, it may proceed at that location within the breeding season.
- **Exception:** Inspection, maintenance, research, or nonconstruction monitoring activities may be performed during the California clapper rail breeding season in areas within or adjacent to breeding habitat (within 500 or 200 feet, as specified above) with USFWS and CDFW approval and under the supervision of a qualified, permitted biologist.

**Explanation of effectiveness:** The implementation of AMM19 would be important for the BDCP Alternatives but not necessary for Alternatives 2D, 4A, and 5A. Because California clapper rail habitat in the Plan Area is limited to areas around Suisun Marsh, only alternatives that include tidal restoration or other activities in this area would have a potential to affect the species.

For the BDCP alternatives, implementation of AMM19 would avoid and minimize take of California clapper rail during the implementation of restoration activities. The preconstruction surveys will allow for the identification of occupied habitat and the proposed timing and buffers will ensure that California clapper rail breeding is not disrupted. These measures would avoid and minimize the potential for harm and harassment of the species. In addition, AMM1–AMM7 and AMM27 include elements that would avoid or minimize the risk of affecting individuals and species habitats adjacent to work areas.

In absence of the implementation of AMM19, AMM1–AMM7, AMM27, and habitat restoration and protection measures, there would be a greater potential for significant impacts on this species due to loss of habitat, take of individuals, and disruption of normal behaviors from construction and/or operation of the proposed project. Refer to the impact analyses for this resource for more detail.

### 3B.4.20 AMM20 Greater Sandhill Crane

If conveyance construction and restoration are to occur during greater sandhill crane wintering season (September 15 through March 15) in the greater sandhill crane winter use area (see BDCP Appendix 2.A, Figure 2.A-19-2), the following avoidance and minimization measures will be implemented.



### 3B.4.20.1 Timing

- Construction will be minimized during the sandhill crane wintering season to the extent practicable in light of project schedule and cost and logistical considerations. For example, construction of some project facilities such as vent shafts may be accelerated so that they occur outside of the crane wintering season. The loudest construction activities, such as pile driving, that need to occur for only limited time periods should be scheduled for periods outside the crane wintering season to the extent practicable.
- To the extent feasible, construction that cannot be completed prior to commencement of the wintering season will be started before September 15 or after March 15, such that no new sources of noise or other major disturbance that could affect cranes will be introduced after the cranes arrive at their wintering grounds.

### 3B.4.20.2 Bird Strike Hazard

#### **Performance Standard: No take, as defined by Section 86 of the California Fish and Game Code, of greater sandhill crane associated with new facilities**

The project will be implemented in a manner that will not result in take of greater sandhill cranes as defined by Section 86 of the California Fish and Game Code. This performance standard will be accomplished by one of, or any combination of, the following:

- Design the transmission line alignment to minimize risk. When locating powerlines, choose specific site locations that are in low risk zones or outside of the greater sandhill crane winter use area.
- Remove, relocate or underground existing lines. Reduce the number of existing lines in risk zones to offset placement of new lines in risk zones. Prioritize elimination or reduction of existing lines and avoidance of new lines in the highest risk zones.
- Underground new lines in high-risk zones of the greater sandhill crane winter use area.
- Use natural gas generators in lieu of transmission lines in high-risk zones of the greater sandhill crane winter use area to provide power for the construction of the water conveyance facilities.
- Install bird strike diverters on existing lines in high-risk zones. Bird strike diverters will be placed on existing lines within the crane use area. The length of existing line to be fitted with bird strike diverters will be equal to the length of new transmission lines constructed as a result of the project, in an area with the same or higher greater sandhill crane strike risk to provide a net benefit to the species. Bird diverters will also be required on all new lines. For optimum results, the recommended spacing distance for bird flight diverters is 15 to 16.5 feet (4.5 to 5 meters) (Avian Power Line Interaction Committee 1994). Bird strike diverters will be installed on project and existing transmission lines in a configuration that research indicates will reduce bird strike risk by at least 60% or more. Bird strike diverters placed on new and existing lines will be periodically inspected and replaced as needed until or unless the project or existing line is removed, or are otherwise no longer a strike risk for greater sandhill cranes. The most effective and appropriate diverter for minimizing strikes with greater sandhill crane on the market according to best available science will be selected.
- Manage habitat to shift cultivated land roost site locations away from risk zones created by new transmission lines. This can be accomplished by not flooding past or current roosting sites located in the vicinity of the new transmission line, thereby eliminating the sites' attractiveness

as roosting habitat; and establishing new roost site equal or greater in size at new location in a lower risk zone but within 1 mile of the affected site. The relocated cultivated land roost site will be established prior to commencement of the wintering season that occurs prior to construction of new transmission lines. The existing cultivated land roost site will be flooded during the wintering season prior to construction; it will not be flooded during the wintering season that occurs during the year construction begins. A wildlife agency-approved, qualified biologist familiar with crane biology will design the new roost site and direct implementation of the roost site establishment.

- Final transmission line design will be determined in coordination with the wildlife agencies and wildlife agency-approved, qualified biologist familiar with crane biology (as described above), to achieve the performance standard and ensure the measures described herein are incorporated.

#### **3B.4.20.2.1 Powerline Plan and Analysis**

Prior to powerline construction, the wildlife agency-approved, qualified crane biologist familiar with crane biology will coordinate with DWR to develop a plan for achieving the performance standard (no take of greater sandhill crane associated with the new facilities) using one or a combination of the measures described above. The plan will include an analysis, using the method described in BDCP Appendix 5.J, Attachment 5.J.C, *Analysis of Potential Bird Collisions at Proposed BDCP Powerlines*, to demonstrate that this standard has been met for the final transmission line alignment. The best available science will be used to estimate bird strike reduction associated with powerline diverters installed on existing lines in highest risk zones for the species and to design and implement roost site surveys as described in Section 3B.4.20.6, *Surveys to Inform Avoidance and Minimization*. To ensure greater sandhill crane habitat loss is avoided and minimized to the maximum extent practicable, wildlife agency staff will be involved in discussions with the powerline provider regarding technical constraints on powerline placement and undergrounding. The final powerline plan and analysis will be subject to review and approval by the wildlife agencies prior to its implementation to ensure that birdstrike risk is minimized and take, as defined by Section 86 of the California Fish and Game Code, is avoided. Powerline construction will be implemented consistent with this plan.

#### **3B.4.20.2.2 Required Measures**

Consistent with the performance standard of no take of greater sandhill crane associated with new facilities, the following measures will also be implemented to minimize bird strike hazard. While any combination of the measures described under *Performance Standard*, above, may be implemented to meet the performance standard, all of the following measures are required.

- During the final powerline design process, undergrounding of all new permanent powerlines will be comprehensively evaluated with respect to cost, operational risks, bird strike risks, and other relevant factors.
- Upon approval by the power providers, bird diverters will be installed on all new temporary and permanent powerlines, following Avian Power Line Interaction Committee protocols. These diverters will be maintained for the entire period that the lines are in place. This may contribute toward meeting the performance standard of no take of greater sandhill crane associated with the new facilities (described above).

- All new above-ground powerlines will be at least 300 feet from all crane roost sites.<sup>1</sup> This can be accomplished through alignment design or through crane roost site relocation. For relocation of cultivated land roost sites, both the existing<sup>20</sup> and new roost site will be flooded a year prior to construction; and the existing roost site will not be flooded during the wintering season that occurs during the year construction begins. For relocation of wetland roost sites, the relocated site will be flooded one year prior to construction; and during construction, both roosting sites will be flooded. A wildlife agency–approved, qualified biologist familiar with crane biology will design new roost sites and direct implementation of roost site establishment. Potential sites will be identified and monitored prior to establishment. Relocated roost sites will be maintained until construction is complete in the affected region.
- New<sup>21</sup> permanent powerlines will be placed outside of areas with a bird strike risk index of 1.0 or greater as shown on Figure 2 in BDCP Appendix 5.J, Attachment 5J.C, *Analysis of Potential Bird Collisions at Proposed BDCP Powerlines*.
- Use of construction equipment greater than 50 feet in height will be minimized to the extent practicable in light of project schedule and cost and logistical considerations.

See also *AMM30 Transmission Line Design and Alignment Guidelines*.

### 3B.4.20.3 Effects on Greater Sandhill Crane Foraging and Roosting Habitat Resulting from CM1 Water Facilities and Operation

The following measures will be implemented to avoid and minimize effects on greater sandhill crane resulting from implementation of the final design of the water conveyance features (*CM1 Water Facilities and Operation*).

#### 3B.4.20.3.1 Foraging Habitat

- Minimize direct loss of foraging habitat. CM1 final design will minimize pile driving and general construction-related loss of greater sandhill crane foraging habitat to the extent practicable.
- Minimize pile driving and general construction-related combined noise effects on foraging habitat. DWR will minimize the area of crane foraging habitat to be affected during the day (from 1 hour after sunrise to 1 hour before sunset) by construction noise exceeding 50 dBA  $L_{eq}$  (1 hour).<sup>22</sup> Combined pile driving and general construction-related noise levels will be estimated prior to commencement of construction using the methods described in BDCP Appendix 5.J, Attachment 5J.D, *Indirect Effects of Construction of the BDCP Conveyance Facility on Greater Sandhill Crane*, incorporating site-specific information related to equipment to be used and existing noise barriers such as levees. Artificial noise barriers may be installed to decrease noise levels at foraging habitat below 50 dBA  $L_{eq}$  (1 hour). However, the visual effects of noise barriers on sandhill cranes are unknown; therefore, all other options to reduce noise will be implemented before installing noise barriers in close proximity to crane habitat.

<sup>20</sup> “Existing” roost habitat is that which is designated by the crane roost model at the time of CM1 plan finalization. The crane roost model will be based on recent survey data as described in Section 3B.4.20.6, *Surveys to Inform Avoidance and Minimization*.

<sup>21</sup> New powerlines are those that did not previously exist, that is, if a powerline is replaced along the same alignment as one that previously existed, then that is not considered a “new” powerline, but a “replacement” powerline.

<sup>22</sup> 50 decibels averaged over a 1-hour period.

- Enhance foraging habitat to avoid loss of foraging values that could otherwise result from unavoidable noise-related effects. DWR will enhance 0.1 acre of foraging habitat for each acre of foraging habitat to be indirectly affected within the 50 dBA  $L_{eq}$  (1 hour) construction noise contour. The enhanced foraging habitat will be established one crane wintering season (September 1 to March 15) prior to construction and will be maintained until the activities causing the indirect noise effect is completed. The enhanced habitat will consist of corn fields that will not be harvested, and will be managed to maximize food availability to greater sandhill cranes (e.g., corn stalks will be knocked down or mulched to make grain available to foraging cranes). A management plan for the enhanced habitat will be completed prior to establishing the habitat, in coordination with a biologist with at least 5 years of experience managing greater sandhill crane habitat on cultivated lands, or experience directing such management. The enhanced habitat will be located outside the construction-related 50 dBA  $L_{eq}$  (1 hour) noise contour and within 1 mile of the affected habitat.

### 3B.4.20.3.2 Roosting Habitat

Preconstruction surveys will be conducted for greater sandhill crane temporary and permanent roost sites within 0.75 mile of the construction area boundary where access is available. Surveys will be conducted during the winter prior to project implementation, over multiple days within the survey area by a qualified biologist with experience observing the species. Alternatively, roost sites within 0.75 mile of the construction area boundary can be identified by a qualified greater sandhill crane biologist familiar with roost sites in the Plan Area. If a greater sandhill crane roost site is located within 0.75 mile of the construction area boundary, then to the extent practicable, nighttime (1 hour before sunset to 1 hour after sunrise) project activities will be relocated to maintain a 0.75-mile nondisturbance buffer. If this is not practicable, the following measures will be implemented to avoid and minimize effects on roosting greater sandhill cranes.

- Avoid direct construction-related loss of roost sites. Activities will be designed to avoid direct loss of crane roost sites. This can be accomplished by siting activities outside identified crane roost sites or by relocating the roost site if it consists of cultivated lands (roost sites that consist of wetlands rather than cultivated lands will not be subject to relocation). A cultivated land roost site can be relocated by not flooding the site where the impact will occur during years when construction will occur and by establishing a new roost site equal or greater in size at a new location away from the disturbance (outside the 50 dBA  $L_{eq}$  [1 hour] pile driving and general construction noise contour) but within 1 mile of the affected site. The relocated roost site will be established one year prior to construction activities affecting the original roost site. A qualified biologist familiar with crane biology will design the new roost site and direct implementation of the roost site establishment. Potential sites will be identified and monitored prior to establishment. Relocated roost sites will be maintained until construction is complete in the affected region. Combined pile driving and general construction-related noise levels will be estimated prior to commencement of construction using the methods described in BDCP Appendix 5.J, Attachment 5J.D, *Indirect Effects of Construction of the BDCP Conveyance Facility on Greater Sandhill Crane*, incorporating site-specific information related to equipment to be used and existing noise barriers such as levees.
- Avoid and minimize pile driving and general construction-related noise effects on roost sites. Activities within 0.75 mile of crane roosting habitat will reduce pile driving and general construction noise during nighttime hours (from 1 hour before sunset to 1 hour after sunrise) such that pile-driving and general construction noise levels do not exceed a combined 50 dBA

$L_{eq}$  (1 hour) at the nearest temporary or permanent roosts during periods when the roost sites are available (flooded). This can be accomplished by limiting construction activities that could result in pile-driving and general construction noise levels above 50 dBA  $L_{eq}$  (1 hour) at the roost site to day time only (from 1 hour after sunrise to 1 hour before sunset); siting nighttime project activities at a sufficient distance from crane roost sites to ensure that pile-driving and general construction noise levels do not exceed a combined 50 dBA  $L_{eq}$  (1 hour) at the roost site; relocating cultivated land or wetland roost sites as described above; and/or installing noise barriers between roost sites within the 50 dBA  $L_{eq}$  (1 hour) contour and the pile-driving and general construction noise source areas, such that construction noise levels at the roost site do not exceed 50 dBA  $L_{eq}$  (1 hour). The installation of noise barriers will be used only if the first three options cannot be implemented to the extent that noise levels do not exceed 50 dBA  $L_{eq}$  (1 hour) at the roost site.

- If the roost site to be indirectly affected within the 50 dBA  $L_{eq}$  (1 hour) pile-driving and general construction combined noise contour is a wetland site rather than cultivated land, then the existing wetland site will not be removed. A new, cultivated land roost site will be temporarily established at a new location away from the disturbance (outside the 50 dBA  $L_{eq}$  (1 hour) noise contour) but within 1 mile of the affected site, at a ratio of 1 acre created for each acre of temporary or permanent roost site within the pile-driving and general construction 50 dBA  $L_{eq}$  (1 hour) noise contour. The new roost site will be established prior to commencement of the wintering season that occurs prior to construction of new powerlines affecting the original roost site, and will be maintained until the activities creating the indirect disturbance are completed. A qualified biologist familiar with crane biology will design the new roost site and direct implementation of the roost site establishment.

#### **3B.4.20.4 Measures to Avoid and Minimize Potential Effects from Lighting and Visual Disturbance**

DWR will implement the following measures to avoid and minimize potential lighting and visual effects that could result from construction or operation and maintenance.

- Route truck traffic to reduce headlight impacts in roosting habitat.
- Install light barriers to block the line-of-sight between the nearest roosting areas and the primary nighttime construction light source areas.
- Operate portable lights at the lowest allowable wattage and height, while in accordance with the National Cooperative Highway Research Program's *Report 498: Illumination Guidelines for Nighttime Highway Work*.
- Screen all lights and direct them down toward work activities and away from the night sky and nearby roost sites. A biological construction monitor will ensure that lights are properly directed at all times.
- Limit the number of nighttime lights used to the greatest extent practicable in light of worker safety requirements.
- Install a vegetation screen or other noise and visual barrier along the south side of Hood Franklin Road along the length of Stone Lake National Wildlife Refuge's property to reduce disturbance to sandhill cranes. The noise and visual barrier will be a minimum of 5 feet high (above the adjacent elevated road, if applicable) and will provide a continuous surface impenetrable by light. This height may be obtained by installing a temporary structure, such as

fencing (e.g., chain link with privacy slats) or a semipermanent structure, such as a concrete barrier (e.g., a roadway median barrier or architectural concrete wall system) retrofitted with an approved visual screen, if necessary, to meet the required height. This barrier will not be installed immediately adjacent to crane foraging habitat, and placement will be coordinated with a qualified crane biologist approved by the wildlife agencies.

### 3B.4.20.5 Staten Island Performance Standard

Because of the density of greater sandhill cranes wintering on Staten Island and the importance of Staten Island to the existing population of the greater sandhill crane in the Plan Area, the final placement of conveyance facilities and RTM at this site will be minimized to the extent practicable, except where the use of RTM on the island affirmatively contributes to the sustainability of the population. Project-related construction will not result in a net decrease in crane use on Staten Island as determined by deriving greater sandhill crane use days for the entire winter period.<sup>23</sup> This standard will be achieved through some combination of the following (and including the above required avoidance and minimization measures for CM1).

- Minimize and/or shift the footprint of activities on Staten Island. The RTM footprint identified on Staten Island is a worst-case scenario. It is expected that the RTM footprint on Staten Island will need to be reduced substantially from shown on the current conveyance facility footprint in order to meet the Staten Island performance standard. Some combination of the following measures will be implemented to achieve this reduction.
  - Stockpile RTM higher than 6 feet to reduce the amount of land affected by RTM stockpiles.
  - Remove RTM from Staten Island periodically during construction to minimize the RTM footprint.
  - Stage the storage and reuse of RTM such that the size of the storage area is minimized at any given time.
  - Reduce RTM storage areas and associated activities during the crane wintering season.
  - Prioritize placement of facilities and RTM in areas of low or no crane use. For example, the very northern end of Staten Island is an area of low crane use that would be a high priority for placement of facilities and RTM.
- Minimize noise, lighting, and visual disturbances during construction (See measures described above for CM1).
- Minimize construction activity and RTM storage during the crane wintering season to the extent practicable.
- Supplemental feeding/foraging habitat enhancement. The enhanced habitat will consist of corn fields that will not be harvested, and will be managed to maximize food availability to greater sandhill cranes. A management plan for the enhanced habitat will be completed prior to

<sup>23</sup> Expected loss of crane use will be estimated by using data on crane use days/acre by habitat type on Staten Island from past studies and future monitoring before construction begins (using averages among available years). These will be used to predict the number of lost crane use days within the footprint of the habitat loss and within the 50 dBA  $L_{eq}$  (1 hour) pile-driving and general construction noise contour. Preproject crane surveys will provide additional data on crane use day densities per habitat type to improve the prediction. Use day densities will be used to guide decisions regarding crop habitat needed to be maintained on Staten Island to maintain this performance standard during construction.

establishing the habitat, in coordination with a qualified crane biologist (with at least 5 years of experience managing greater sandhill crane habitat on cultivated lands, or experience directing such management). The enhanced habitat will be located outside the construction-related 50 dBA  $L_{eq}$  (1 hour) noise contour and within 1 mile of the affected habitat.

- Maintain flooding and irrigation capacity. Stage CM1 activities on Staten Island such that they do not disrupt flooding and irrigation to the extent that greater sandhill crane habitat will be reduced during the crane wintering season.
- In determining any long-term uses of RTM on Staten Island, priority will be given to uses that are consistent with the sustainability of greater sandhill crane habitat on the island. RTM will be moved off the island after short-term use or storage unless a determination is made that long-term use of the RTM on Staten Island will not be detrimental to the crane population on the island.

Prior to construction on Staten Island, the qualified, wildlife agency–approved crane biologist will coordinate with DWR to develop a strategy for achieving the Staten Island performance standard using a combination of the measures described above, and prepare a plan based on the final construction design on Staten Island that includes all avoidance and minimization measures necessary for achieving the performance standard. This plan will be subject to review and approval by the wildlife agencies prior to its implementation. All avoidance and minimization measures will be in place, consistent with the plan, prior to project construction on Staten Island.

#### **3B.4.20.6 Surveys to Inform Avoidance and Minimization**

The modeling method used to inform the placement of diverters on existing lines in high-risk zones of the greater sandhill crane winter use area and to evaluate the acres of foraging and roosting habitat affected by the 50 dB noise contour requires spatially explicit roosting and foraging habitat and population density models. The GIS-based methods used to determine the total effected and compensatory habitat will be performed once, at the time of CM1 plan finalization. The greater sandhill crane roosting and survey data used to evaluate habitat loss, and to identify lands in fulfillment of minimization requirements, at the time of CM1 plan finalization will be no more than two wintering seasons old at the time of the evaluation. This allows for avoidance and minimization requirements to be quantified using up-to-date information. If DWR chooses to phase avoidance and minimization quantification along with construction phasing, the roosting and foraging habitat and population data must be updated so that it is never more than five years old. The greater sandhill crane roosting and foraging habitat and population models will be updated using on-the-ground surveys performed by a wildlife agency–approved, qualified biologist familiar with crane biology and experienced with crane population-level survey techniques. The greater sandhill crane foraging habitat model can be updated using agricultural land-use data or a combination of land-use and survey data.

***Explanation of effectiveness:*** In the absence of other conservation actions, the effects on greater sandhill crane habitat from project construction and the installation of new transmission lines would represent an adverse effect as a result of habitat modification of a special-status species and potential take as defined under Section 86 of the California Fish and Game Code. Implementation of AMM1–AMM7, AMM10, and AMM20 would offset impacts from the proposed project so that it would not result in a substantial adverse effect through habitat modifications and would not substantially reduce the number or restrict the range of greater sandhill cranes.

AMM20 provides specific guidance for avoiding and minimizing the effects from noise, lighting, and visual disturbance associated with construction on sandhill cranes occurring adjacent to construction areas. The measure includes specific performance standards for the population on Staten Island. The standards include recommendations on construction timing and implementation, and calls for specific actions to maintain and enhance habitat on Staten Island during construction, which would minimize the effect of project construction on the cranes roosting on Staten Island.

AMM20 would also serve to benefit lesser sandhill cranes.

In absence of the implementation of AMM20, AMM1–AMM7, AMM10, and habitat restoration and protection measures, there would be a greater potential for significant impacts on this species due to loss of habitat, take of individuals, and disruption of normal behaviors from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### **3B.4.21 AMM21 Tricolored Blackbird**

Prior to implementation of covered activities, a qualified biologist with experience surveying for and observing tricolored blackbird will conduct a preconstruction survey to establish use of suitable habitat by tricolored blackbird colonies. Surveys will be conducted in suitable habitat within 1,300 feet of proposed construction areas, where access allows, during the nesting season (generally March 15 to July 31) 1 year prior to, and then again the year of, construction. During each year, surveys will be conducted monthly in March, April, May, June, and July. If construction is initiated at a site during the nesting season, 3 surveys will be conducted within 15 days of construction with one of the surveys within 5 days of the start of construction. The CDFW Suisun Marsh Unit tracks tricolored blackbird colonies yearly in Suisun Marsh as part of the University of California, Davis/USFWS tricolored blackbird portal project; these records will also be searched and staff at the portal project consulted for recent colony information. If active tricolored blackbird nesting colonies are identified, minimization requirements and construction monitoring will be required.

Project activities will avoid active tricolored blackbird nesting colonies and associated habitat during the breeding season (generally March 15–July 31). Avoidance measures will include relocating covered activities away from the nesting colonies and associated habitat to the maximum extent practicable.

Projects (construction and restoration) will be designed to avoid construction activity to the maximum extent practicable up to 1,300 feet, but not less than a minimum of 300 feet, from an active tricolored blackbird nesting colony. This minimum buffer may be reduced in areas with dense forest, buildings, or other habitat features between the construction activities and the active nest colony, or where there is sufficient topographic relief to protect the colony from excessive noise or visual disturbance as determined by a biologist experienced with tricolored blackbird.

Project activities potentially affecting a nesting colony will be monitored by a qualified biologist to verify that the activity is not disrupting the colony. If it is, the activity will be modified, as practicable, by either delaying construction until the colony abandons the site or until the end of the breeding season, whichever occurs first, temporarily relocating staging areas, or temporarily rerouting access to the construction site. DWR technical staff will consult with the fish and wildlife agencies and evaluate exceptions to the minimum nondisturbance buffer distance on a case-by-case basis.



Prior to initiation of construction within 300 feet of suitable roosting habitat, a CDFW-approved biologist with experience surveying for and observing tricolored blackbirds will conduct preconstruction surveys to establish use of roosting habitat by tricolored blackbird colonies. Surveys will be conducted in suitable habitat where access is available within 300 feet of proposed construction areas during the nonbreeding season (generally August 1 to March 14) 1 year prior to, and then again the year of, construction. If construction is initiated at a site during the nonbreeding season, 3 surveys will be conducted within 15 days prior to construction with one of the surveys within 5 days prior to the start of construction.

Construction and restoration projects will also be designed, in consultation with CDFW, to avoid construction activity within at least 300 feet from occupied active tricolored blackbird roosting habitat. This minimum buffer may be reduced in areas with dense forest, buildings, or other habitat features between the construction activities and the active roosting site, or where there is sufficient topographic relief to protect the roosting site from excessive noise or visual disturbance, or where sound curtains are used, as determined by a CDFW-approved biologist experienced with tricolored blackbird.

Covered activities that are within 300 feet of occupied roosting habitat will be monitored by a CDFW-approved biologist familiar with tricolored blackbird behavior patterns to verify that the activity is not disrupting the roosting birds. If it is, the activity will be modified, as practicable, by delaying construction until the blackbirds are no longer using the roosting site, temporarily relocating staging areas, temporarily rerouting access to the construction site, or use of sound curtains. The CDFW-approved biologist will evaluate the nondisturbance buffer distance on a case-by-case basis.

Geotechnical exploration activities and transmission line activities will fully avoid tricolored blackbird nesting and roosting habitat.

***Explanation of effectiveness:*** In the absence of other conservation actions, the effects on tricolored blackbird habitat from the proposed project would represent an adverse effect as a result of habitat modification and potential for direct mortality of a special-status species. The acres of protection and restoration proposed in addition to the detailed habitat value goals are more than sufficient to satisfy the typical mitigation ratios that would be applied to the project-level effects of water conveyance construction and the impacts from restoration on nesting, roosting, and cultivated lands foraging habitat. With the protection and restoration acres, and the implementation of AMMs, including AMM21, project implementation in the near-term time period would result in a less-than-significant impact on tricolored blackbird.

AMM21 would identify the locations of active nesting colonies and occupied roosting sites in advance of construction activities so that appropriate avoidance buffers can be established to avoid and minimize adverse effects on nesting colonies and roosting sites. These measures would avoid and minimize the potential for substantially reducing the number of tricolored blackbirds in the region.

In absence of the implementation of AMM21, AMM1–AMM7, AMM10, and habitat restoration and protection measures, there would be a greater potential for significant impacts on this species due to loss of habitat, take of individuals, and disruption of normal behaviors from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

## 3B.4.22 AMM22 Suisun Song Sparrow, Yellow-Breasted Chat, Least Bell's Vireo, Western Yellow-Billed Cuckoo

Preconstruction surveys of potential breeding habitat for the Suisun song sparrow, yellow-breasted chat, least Bell's vireo, and western yellow-billed cuckoo will be conducted within 500 feet project activities where access is available. At least five surveys will be conducted in suitable habitats within 30 days of the onset of construction, with the last within 3 days of the onset of construction, by a qualified biologist with experience surveying and observing these species and familiar with their vocalizations.

If an active nest site is present, a 250-foot nondisturbance buffer will be established around chat nest sites and a 500-foot nondisturbance buffer around least Bell's vireo, Suisun song sparrow, and western yellow-billed cuckoo nest sites during the breeding season (generally, late February through late August for yellow-breasted chat, least Bell's vireo, and western yellow-billed cuckoo, and early April through late August for Suisun song sparrow).

Disturbance to previous least Bell's vireo nesting sites (for up to 3 years since known nest activity) will also be avoided during the breeding season unless the disturbance is to maintain public safety. Least Bell's vireo uses previous nesting sites, and disturbance during the breeding season may preclude birds from using existing unoccupied nest sites.

The required buffer may be reduced in areas where barriers or topographic relief are sufficient protect the nest from excessive noise or other disturbance. Implementation Office technical staff will coordinate with the fish and wildlife agencies and evaluate exceptions to the minimum nondisturbance buffer distance on a case-by-case basis.

If occupied nests are identified, a qualified biologist will monitor construction activities in the vicinity of all active yellow-breasted chat, least Bell's vireo, western yellow-billed cuckoo, and Suisun song sparrow nests to ensure that covered activities do not affect nest success.

To the extent feasible, the contractor will employ best practices to reduce construction noise during daytime and evening hours (7:00 a.m. to 10:00 p.m.) such that construction noise levels do not exceed 60 dBA  $L_{eq}$  (1 hour) at the nearest western yellow-billed cuckoo migratory habitat during migration periods. Limit construction during nighttime hours (10:00 p.m. to 7:00 a.m.) such that construction noise levels do not exceed 50 dBA  $L_{max}[1]$  at the nearest residential land uses. Limit pile driving to daytime hours (7:00 a.m. to 7:00 p.m.). Locate, store, and maintain portable and stationary equipment 300 feet away from suitable western yellow-billed cuckoo habitat during migration periods, and 300 feet from active breeding sites. Employ preventive maintenance including practicable methods and devices to control, prevent, and minimize noise. Except where equipment must cross through riparian zones, route truck traffic to at least 300 feet from suitable western yellow-billed cuckoo migratory habitat during migration periods. Limit trucking activities (e.g., deliveries, export of materials) to the hours of 7:00 a.m. to 10:00 p.m. within 300 feet of cuckoo migration habitat during migration periods. Screen all lights and direct them down toward work activities away from migratory habitat. A biological construction monitor will ensure that lights are properly directed at all times. Operate portable lights at the lowest allowable wattage and height, while in accordance with the National Cooperative Highway Research Program's Report 498: *Illumination Guidelines for Nighttime Highway Work*.

**Explanation of effectiveness:** AMM22 will serve to reduce the magnitude of the project's effects on Suisun song sparrow, yellow-breasted chat, least Bell's vireo, and western yellow-billed cuckoo by

requiring preconstruction nest surveys so that avoidance buffers and restrictions on construction-related noise are established in order to avoid and minimize disturbance to nesting activities and the potential for take of a rare species.

In the absence of other conservation actions, the loss of western yellow-billed cuckoo habitat associated with the proposed project would represent an adverse effect as a result of habitat modification and potential for direct mortality of a special-status species. However, the species is not an established breeder in the study area and current presence is limited to migrants. In addition, the habitat that would be lost consists of small, fragmented riparian stands that do not provide high-value habitat for the species. With habitat protection and restoration and which would be in place throughout the construction period, the effects of habitat loss and potential mortality on western yellow-billed cuckoo under the proposed project would be less-than-significant.

In absence of the implementation of AMM22, AMM1–AMM7, AMM10, and habitat restoration and protection measures, there would be a greater potential for significant impacts on these species due to loss of habitat, take of individuals, and disruption of normal behaviors from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### **3B.4.23 AMM23 Western Burrowing Owl**

AMMs for western burrowing owl will only be required for water conveyance construction, restoration, and operations and maintenance activities occurring within suitable habitat as identified from habitat assessments conducted in advance of initiating ground disturbing and staging activities. This AMM incorporates survey, avoidance, and minimization guidelines taken primarily from CDFW's *Staff Report on Burrowing Owl Mitigation* (California Department of Fish and Game 2012). For the BDCP alternatives, also see AMM37 for measures to avoid and minimize recreation-related effects on this species.

#### **3B.4.23.1 Preconstruction Surveys**

Western burrowing owl surveys will be required within and adjacent to (within 500 feet) water conveyance work areas and restoration sites where suitable habitat has been identified during habitat assessment surveys where access is available. Surveys will be conducted during the breeding season that precedes construction.

Four survey visits will be conducted with at least one site visit between February 15 and April 15 and a minimum of three survey visits, at least three weeks apart, between April 15 and July 15, with at least one visit after June 15. Surveys will be conducted between 10:00 am and two hours before sunset. A qualified biologist will survey the project area and record and map all burrowing owl observations and burrows that may be occupied (as indicated by tracks, feathers, egg shell fragments, pellets, prey remains, cast pellets, whitewash, or decoration) on the project site. The surveys will be conducted while walking transects throughout the entire project footprint, plus all accessible areas within a 500-foot radius of the project footprint. The centerlines of these transects will be spaced 15 to 60 feet apart and will vary in width to account for changes in terrain and vegetation that can preclude complete visual coverage of the area. For example, in hilly terrain with patches of tall grass, transects will be closer together, while in open areas with little vegetation they can be 60 feet apart. Surveyors will stop at least every 300 feet along each transect to scan the entire visible area for presence of burrowing owls. Adjacent parcels under different land ownership will be surveyed only if access is granted or if the parcels are visible from authorized areas.

In addition, preconstruction surveys will be conducted with one occurring 14 days prior to ground breaking and/or staging activities and another within 24 hours of these activities. These surveys will confirm whether owls identified during the breeding season surveys are still present or whether the site has since become occupied by burrowing owls.

### **3B.4.23.2 Avoidance and Minimization**

To the extent feasible, burrowing owls will be avoided by relocating work areas with flexible locations, such as geotechnical exploration sites and restoration sites. Within the construction footprint where ground disturbance cannot avoid burrowing owls, owls will be relocated during the nonbreeding season and burrows will be excavated.

If an active burrow is identified near a work area and work cannot be conducted outside of the nesting season (February 1 to August 31), a qualified biologist will establish a no-activity buffer that extends a minimum of 250 feet around the burrow. If burrowing owls are present at the site during the nonbreeding season (September 1 through January 31), a qualified biologist will establish a no-activity zone that extends a minimum of 150 feet around the burrow.

If the appropriate no-activity buffer for breeding or nonbreeding burrowing owls cannot be established, a wildlife biologist experienced in burrowing owl behavior will evaluate site-specific conditions and, in consultation with CDFW, recommend a smaller buffer that still minimizes the potential to disturb the owls (and still allows reproductive success during the breeding season). The site-specific buffer will be established by taking into consideration the type and extent of the proposed activity occurring near the occupied burrow, the duration and timing of the activity, the sensitivity and habituation of the owls to existing conditions, and the dissimilarity of the proposed activity to background activities. If an appropriate buffer cannot be established around the active owl burrows, actions will be taken to exclude the owls from the site per the requirements below.

A biological monitor will be present during all construction activities occurring within any reduced buffers. If during the breeding season there is any change in owl nesting and foraging behavior as a result of construction activities, the biological monitor will work with construction personnel and the Environmental Manager to provide additional protections to reduce disturbance, such as adding visual and sound curtains; any modifications to the standard protections will be in consultation with CDFW.

If monitoring indicates that the nest is abandoned prior to the end of nesting season and the burrow is no longer in use by owls, the no-activity buffer may be removed. If necessary because the burrow cannot be avoided by construction activity, the biologist will excavate and collapse the burrow to prevent reoccupation.

### **3B.4.23.3 Burrowing Owl Relocation**

No exclusion of burrowing owls will occur during the breeding season. If burrowing owls are present within the construction footprint and cannot be avoided during the nonbreeding season (generally September 1 through January 31), they will be relocated through passive relocation, with or without burrow exclusion. Passive relocation will be used when 1) there is a sufficient amount of suitable habitat adjacent to the work area to support nesting and foraging, 2) there are compatible land use practices in the area and 3) the area is preferably currently under or proposed for conservation.

Passive relocation will be conducted during the nonbreeding season; however passive relocation techniques may be used during the breeding season (February 1 through August 30) if a qualified biologist, coordinating with CDFW, determines through site surveillance that the burrow is not occupied by a breeding pair, young, or eggs. To the extent feasible, passive relocation will be first be considered without the use of exclusion devices in order to avoid and minimize harassment of owls.

### **3B.4.23.3.1 Passive Relocation without Exclusion**

Prior to relocating owls, all potential burrowing owl burrows in suitable nesting habitat and within the project footprint and 75 feet around the footprint, will be surveyed for owl use, and excavated if no owls are found. If occupied burrows are found, two natural or artificial burrows will be provided for each occupied burrow in the above defined survey area, at least 250 feet from the construction footprint. Artificial burrows will be installed following the methods in Barclay (2008) and Johnson et al (2010). Sites used for artificial burrows will either be properties currently used for or proposed for conservation. After constructing the artificial burrows, the owls will be given 60 days to relocate on their own. The project area will be monitored weekly for up to 60 days to determine whether the owls have left the burrow and to attempting to confirm occupancy at the artificial or other nearby burrows. The formerly occupied burrows will then be excavated. Whenever possible, burrows will be excavated using hand tools and refilled to prevent reoccupation. Sections of flexible plastic pipe (at least 3 inches in diameter) will be inserted into burrows during excavation to maintain an escape route for any animals inside the burrow.

### **3B.4.23.3.2 Passive Relocation with Exclusion**

If the burrowing owls found in the above survey area do not relocate on their own through the above methodology, passive relocation will be accomplished by installing one-way doors (e.g., modified dryer vents). The one-way doors will be left in place for a minimum of 48 hours and be monitored twice daily to ensure that the owls have left the burrow. The burrow will be excavated using hand tools, and a section of flexible plastic pipe (at least 3 inches in diameter) will be inserted into the burrow tunnel during excavation to maintain an escape route for any animals that may be inside the burrow.

***Explanation of effectiveness:*** The loss of western burrowing owl habitat and potential for mortality of this special-status species under the proposed project would represent an adverse effect in the absence of other conservation actions. However, with habitat protection and restoration and with implementation of AMM1–AMM6, AMM10, and AMM23, the loss of habitat or direct mortality through implementation of the proposed project would not result in a substantial adverse effect through habitat modifications and would not substantially reduce the number or restrict the range of the species.

The preconstruction surveys, buffers, monitoring, and passive relocation measures in AMM23 would avoid and minimize the potential for take of owls and the disruption of normal behaviors, including nesting.

In absence of the implementation of AMM23, CMs and other AMMs, there would be a greater potential for significant impacts on this species due to loss of habitat, take of individuals, and disruption of normal behaviors from construction and/or operation of the proposed project. Refer to the impact analyses for the species for more detail.

### 3B.4.24 AMM24 San Joaquin Kit Fox

To avoid direct effects of covered activities on San Joaquin kit fox, the following measures will be implemented. This AMM is based on USFWS's *Standardized Recommendations for Protection of the Endangered San Joaquin Kit Fox prior to or during Ground Disturbance* (U.S. Fish and Wildlife Service 2011). For the BDCP alternatives, also see AMM37 for measures to avoid and minimize recreation-related effects on this species.

San Joaquin kit fox surveys will only be required for projects (including but not limited to establishment of trails and other recreational facilities) occurring within suitable habitat as identified from the habitat modeling and by additional assessments conducted during the planning phase of construction and restoration projects. A qualified biologist will conduct a field evaluation to identify suitable breeding or denning habitat for kit fox for all covered activities that occur in noncultivated lands in Conservation Zone 8. If the project overlaps with, or is within 250 feet of suitable kit fox habitat, preconstruction surveys will be required.

Within 14 to 30 days prior to ground disturbance related to covered activities, a qualified biologist with experience surveying for and observing the species will conduct a preconstruction survey in areas identified by the habitat assessment as being suitable breeding or denning habitat. The biologist will survey the project footprint and the area within 250 feet beyond the footprint to identify known or potential San Joaquin kit fox dens. Adjacent parcels under different land ownership will not be surveyed unless access is granted within the 250-foot radius. The biologists will conduct these searches by systematically walking 30- to 100-foot-wide transects throughout the survey area; transect width will be adjusted based on vegetation height and topography (California Department of Fish and Game 1990). The biologist will conduct walking transects such that 100% visual coverage of the project footprint is achieved. Dens will be classified in one of the following four den status categories.

- **Potential den.** Any subterranean hole within the species' range that has entrances of appropriate dimensions for which available evidence is sufficient to conclude that it is being used or has been used by a kit fox. Potential dens comprise any suitable subterranean hole or any den or burrow of another species (e.g., coyote, badger, red fox, or ground squirrel) that otherwise has appropriate characteristics for kit fox use. If a potential den is found, the biologist will establish a 50-foot buffer using flagging.
- **Known den.** Any existing natural den or artificial structure that is used or has been used at any time in the past by a San Joaquin kit fox. Evidence of use may include historical records; past or current radiotelemetry or spotlighting data; kit fox sign such as tracks, scat, and/or prey remains; or other reasonable proof that a given den is being or has been used by a kit fox.
- **Natal or pupping den.** Any den used by kit foxes to whelp and/or rear their pups. Natal/pupping dens may be larger with more numerous entrances than dens occupied exclusively by adults. These dens typically have more kit fox tracks, scat, and prey remains in the vicinity of the den and may have a broader apron of matted dirt and/or vegetation at one or more entrances. A natal den, defined as a den in which kit fox pups are actually whelped but not necessarily reared, is a more restrictive version of the pupping den. In practice, however, it is difficult to distinguish between the two; therefore, for purposes of this definition, either term applies. If a natal den is discovered, a buffer of at least 200 feet will be established using fencing.

- 1 • **Atypical den.** Any artificial structure that has been or is being occupied by a San Joaquin kit fox.  
2 Atypical dens may include pipes, culverts, and diggings beneath concrete slabs and buildings. If  
3 an atypical den is discovered, the biologist will establish a 50-foot buffer using flagging.

4 The following measures will be implemented to avoid or minimize direct effects of project activities  
5 on San Joaquin kit fox:

- 6 • The biologist will flag all potential small mammal burrows within 50 feet of the project site to  
7 alert biological and work crews of their presence. Disturbance to all San Joaquin kit fox dens will  
8 be avoided, to the extent possible. Limited destruction may be allowed, if avoidance is not a  
9 reasonable alternative, provided the following procedures are observed.
- 10 • If a suitable San Joaquin kit fox den is discovered in the project footprint, the den will be  
11 monitored for 4 days by a USFWS- and CDFW-approved biologist using a tracking medium or an  
12 infrared beam camera to determine if the den is currently being used.
- 13 • Unoccupied dens will be destroyed immediately to prevent subsequent use. The den will be fully  
14 excavated by hand, filled with dirt, and compacted to ensure that San Joaquin kit foxes cannot  
15 reenter or use the den during the construction period.
- 16 • If an active or natal or pupping den is found, USFWS and CDFW will be notified immediately. The  
17 den will not be destroyed until the pups and adults have vacated and then only after further  
18 coordination with USFWS and CDFW.
- 19 • If kit fox activity is observed at the den during the initial monitoring period, den use will be  
20 actively discouraged, as described below, and monitoring will continue for an additional 5  
21 consecutive days from the time of the first observation to allow any resident animals to move to  
22 another den. For dens other than natal or pupping dens, use of the den can be discouraged by  
23 partially plugging the entrance with soil such that any resident animal can easily escape. Once  
24 the den is determined to be unoccupied it may be excavated under the direction of the biologist.  
25 Alternatively, if the animal is still present after 5 or more consecutive days of plugging and  
26 monitoring, the den may have to be excavated by hand when, in the judgment of a biologist, it is  
27 temporarily vacant (i.e., during the animal's normal foraging activities). If at any point during  
28 excavation a kit fox is discovered inside the den, the excavation activity will cease immediately  
29 and monitoring of the den, as described above, will be resumed. Destruction of the den may be  
30 completed when, in the judgment of the biologist, the animal has escaped from the partially  
31 destroyed den.
- 32 • Construction and operational requirements from *Standardized Recommendations for Protection*  
33 *of the San Joaquin Kit Fox prior to or during Ground Disturbance* (U.S. Fish and Wildlife Service  
34 2011) or the latest guidelines will be implemented.
- 35 • Noise will be minimized to the extent feasible at the work site to avoid disturbing kit foxes.
- 36 • If suitable dens are identified in the project footprint or within a 250-foot buffer, exclusion  
37 zones around each den entrance or cluster of entrances will be demarcated. The configuration of  
38 exclusion zones will be circular, with a radius measured outward from the den entrance(s). No  
39 covered activities will occur within the exclusion zones. Exclusion zone radii for atypical dens  
40 and suitable dens will be at least 50 feet and will be demarcated with four to five flagged stakes.  
41 Exclusion zone radii for known dens will be at least 100 feet and will be demarcated with  
42 staking and flagging that encircle each den or cluster of dens but do not prevent access to the  
43 den by the foxes.

- Written results of the surveys will be submitted to USFWS within 5 calendar days of the completion of surveys and prior to the beginning of ground disturbance and/or construction activities likely to affect San Joaquin kit foxes.

**Explanation of effectiveness:** In the absence of other conservation actions, the effects on San Joaquin kit fox habitat from the proposed project would represent a significant impact as a result of habitat modification and potential direct mortality of a special-status species. However, with habitat protection, restoration, management, and enhancement and with implementation of AMM1 – AMM6 and AMM24, which would be in place throughout the time period of construction, the impact of the proposed project as a whole on San Joaquin kit fox would be less than significant.

The preconstruction den surveys, establishment of buffers, and implementation of other measures in AMM24 would ensure that harm and harassment of San Joaquin kit fox is avoided and minimized to the maximum extent feasible. AMM24 would also serve to identify dens occupied by American badger.

In absence of the implementation of AMM24, AMM1 – AMM6, and habitat restoration and protection, there would be a greater potential for significant impacts on this species due to loss of habitat, take of individuals, and disruption of normal behaviors from construction and/or operation of the proposed project. Refer to the impact analyses for the species for more detail.

### 3B.4.25 AMM25 Riparian Woodrat and Riparian Brush Rabbit

AMMs for riparian woodrat and riparian brush rabbit will only be required for projects occurring within suitable habitat as identified from the habitat modeling and by additional assessments conducted during the planning phase of construction or restoration projects. A qualified biologist will conduct a field evaluation of suitable habitat for both species for all covered activities that occur within Conservation Zone 7. One known population of riparian brush rabbit occurs in the Plan Area (in Conservation Zone 7); no known populations of riparian woodrat occur in the Plan Area. If the project does not fully avoid effects on suitable habitat, the following measures will be required.

- Assess habitat suitability for both species and, if habitat is considered potentially occupied and cannot be avoided, conduct protocol-level surveys according to the USFWS (no date [b]) *Draft Habitat Assessment Guidelines and Survey Protocol for the Riparian Brush Rabbit and the Riparian Woodrat*.
- If occupied riparian woodrat or riparian brush rabbit habitat is present in project site, redesign project to the extent possible to avoid occupied habitat. Design tidal natural communities restoration projects (*CM4 Tidal Natural Communities Restoration*) to completely avoid permanent or temporary loss of occupied riparian brush rabbit and riparian woodrat habitat. If occupied riparian woodrat or riparian brush rabbit habitat is present in the construction facility corridor, consider reducing the corridor width to avoid occupied riparian habitat and, if feasible, tunnel beneath the occupied riparian corridor.
- If occupied riparian woodrat or riparian brush rabbit habitat cannot be avoided, avoid mortality through implementation of a trapping and relocation program. Develop the program in coordination with USFWS, and relocate to site approved by USFWS prior to construction activities.
- DWR will implement the following measures to avoid and minimize noise and lighting related effects on the species: Establish a 1,200-foot nondisturbance buffer between any project



activities and suitable habitat. Establish a 1,200-foot buffer between any lighting and pile driving and suitable habitat. Screen all lights and direct them down toward work activities away from potential occupied habitat. A biological construction monitor will ensure that lights are properly directed at all times. Operate portable lights at the lowest allowable wattage and height, while in accordance with the National Cooperative Highway Research Program's Report 498: Illumination Guidelines for Nighttime Highway Work. Limit construction during nighttime hours (10:00 p.m. to 7:00 a.m.) such that construction noise levels do not exceed 50 dBA  $L_{max}$  at the nearest residential land uses. Limit pile driving to daytime hours (7:00 a.m. to 6:00 p.m.).

**Explanation of effectiveness:** Implementation of the proposed project would result in temporary and permanent losses of modeled habitat for riparian woodrat and riparian brush rabbit, and potential direct mortality of both species. However, the habitat restoration and protection and implementation of AMM1–AMM7, AMM10, and AMM25 would offset significant impacts so that the proposed project would not represent a substantial adverse effect through habitat modifications and would not substantially reduce the number or restrict the range of the species.

AMM25 would serve to identify suitable habitat so that it could possibly be avoided, and it would result in the establishment of buffers to avoid and minimize disturbance of individuals. AMM25 establishes a process to trap and relocate individuals in occupied areas that can't be avoided. These measures would minimize the effects of the project on populations occurring within the Delta and on the species as a whole.

In absence of the implementation of AMM25, AMM1–AMM7, AMM10, and habitat restoration and protection measures, there would be a greater potential for significant impacts on these species due to loss of habitat and potential take of these species from construction and/or operation of the proposed project. Refer to the impact analyses for each species for more detail.

### 3B.4.26 AMM26 Salt Marsh Harvest Mouse and Suisun Shrew

Where suitable salt marsh harvest mouse or Suisun shrew habitat has been identified within a tidal restoration work area or within 100 feet of a tidal restoration work area where ground-disturbing activities will occur (e.g., at a levee breach or grading location) a CDFW- and USFWS-approved biologist will conduct preconstruction surveys for the mouse prior to ground disturbance. If a mouse is discovered, tidal restoration activities near the mouse will cease until wildlife staff can be contacted and a relocation plan can be developed. Prior to tidal restoration ground-disturbing activities, vegetation will first be removed with nonmechanized hand tools (e.g., goat or sheep grazing, or in limited cases where the biological monitor can confirm that there is no risk of harming salt marsh harvest mouse or Suisun shrew, hoes, rakes, and shovels) may be used to allow salt marsh harvest mouse and Suisun shrew to move out of the location. Vegetation must be cleared to bare ground and removed from the work area, including roads. The upper six inches of soil excavated within salt marsh harvest mouse habitat will be stockpiled and replaced on top of backfilled material. Vegetation will be removed under supervision of a CDFW- and USFWS-approved biological monitor familiar with salt marsh harvest mouse and Suisun shrew. Vegetation removal will start at the edge farthest from the salt marsh and work its way towards the salt marsh. This method of removal provides cover for salt marsh harvest mouse and Suisun shrew and allows them to move towards the salt marsh as vegetation is being removed.

Temporary exclusion fencing will be placed around a defined tidal restoration work area before construction activities start and immediately after vegetation removal. The fence should be made of

material that does allow a salt marsh harvest mouse to pass through and should be buried to a depth of 2 inches so that mice cannot crawl under the fence. Supports for the fence must be placed on the inside of the exclusion area. Prior to the start of daily activities during initial ground disturbance, the CDFW- and USFWS-approved biologist will inspect the salt marsh harvest mouse-proof boundary for holes or rips. The work area will also be inspected to ensure no mice are trapped inside. Any mice found along or outside the fence will be closely monitored until they move away from the construction site. Tidal restoration work will be scheduled to avoid extreme high tides (6.5 feet or above, as measured at the Golden Gate Bridge) to allow for salt marsh harvest mouse and Suisun shrew to more easily move to higher grounds.

The CDFW- and USFWS-approved biologist with previous salt marsh harvest mouse experience will be on site during construction activities related to tidal restoration in suitable mouse habitat. The biologist will document compliance with the project permit conditions and avoidance and conservation measures. The approved biologist has the authority to stop tidal restoration activities if any of the requirements associated with this measure are not being fulfilled. If the CDFW- and USFWS-approved biologist requests work stoppage because of take of any listed species, CDFW and USFWS staff will be notified within one day by e-mail or telephone.

***Explanation of effectiveness:*** Implementation of the project would result in temporary and permanent losses of modeled habitat for salt marsh harvest mouse and Suisun shrew and potential direct mortality of salt marsh harvest mouse and Suisun shrew. However, the habitat restoration and protection and implementation of AMM1–AMM6, AMM10, and AMM26 would offset significant impacts so that the proposed project would not represent a substantial adverse effect through habitat modifications and would not result in take of salt marsh harvest mouse and Suisun shrew as defined in Section 86 of the California Fish and Game Code.

AMM26 would incorporate measures into tidal restoration planning in Suisun Marsh such that take of salt marsh harvest mouse and Suisun shrew would be avoided and minimized. Under AMM26, vegetation would be removed through nonmechanized means to avoid harming these species exclusion fencing to keep animals from entering active work areas would be installed, and a monitor would ensure that the measures in AMM26 are implemented appropriately.

In absence of the implementation of AMM26, AMM1–AMM6, AMM10, and habitat restoration and protection measures, there would be a greater potential for significant impacts on these species due to loss of habitat and loss of species from construction and/or operation of the proposed project. Refer to the impact analyses for each species for more detail.

### 3B.4.27 AMM27 Selenium Management

Under *AMM27 Selenium Management*, DWR will minimize conditions resulting from project activities that could potentially promote mobilization of selenium into the food chain. Specifically, this measure will promote the following actions:

- Evaluation of the potential for project activities to increase selenium bioavailability for identified higher risk geographic areas of the Plan Area
- Implementation of site selection, design and adaptive management strategies to minimize increases in selenium in the aquatic food chain
- Implementation of post-restoration programs to monitor for possible increases in selenium due to BDCP actions

For descriptions of the current condition of selenium in the Plan Area, see BDCP Appendix 5.D, *Contaminants*; BDCP Chapter 2, *Existing Ecological Conditions*; and BDCP Chapter 3, Section 3.3, *Biological Goals and Objectives*.

### 3B.4.27.1 Problem Statement

Selenium is a naturally occurring element in Delta sediments, soil, and adjacent mountains. However, in some areas it has been concentrated and mobilized, mainly by recirculation of irrigation water through selenium-containing soils during agricultural operations, especially in the San Joaquin Valley. Historically the San Joaquin River has been the primary contributor of selenium to the Delta.

This AMM addresses mechanisms related to project activities that could result in increased exposure of species to selenium, as described below.

- *Water Operations* could result in an increase in the ratio of the contributions to the Delta from San Joaquin River relative to the Sacramento River, leading to overall increased selenium loading to the Delta, and specifically the South Delta
- *Restoration actions* could result in mobilization of selenium, depending on the amount of selenium in the newly inundated sediments, the length of inundation (residence time), and whether sufficient time allows the selenium to cycle through the aquatic system into the food chain.

Selenium is more bioavailable in an aquatic system compared to upland locations, and inundation of ROAs could mobilize selenium sequestered in soils, and increase exposure of covered species. In aquatic systems, selenium is most mobile in chemically reducing conditions. Such conditions are maximized in areas of slow moving water, longer water residence times and low flushing rates (Presser and Luoma 2006; Lemly 1998). The longer residence times also allow the selenium to move up the food chain. Bioaccumulation is much higher for benthic-based food chains than for pelagic-based. Sessile filter feeders can bioaccumulate and pass up to higher trophic levels hundreds of times the waterborne concentration of selenium. However, plankton excrete most of the selenium they consume and it is not bioaccumulated and passed through the food chain (Stewart et al. 2004)

### 3B.4.27.2 Implementation

#### 3B.4.27.2.1 Water Operations

DWR will maintain a selenium monitoring program in conjunction with ongoing state and federal led monitoring programs. Before implementation of *Water Operations*, DWR will prepare a comprehensive Selenium Monitoring Program. This program will include reporting on a yearly basis, at a minimum to state and federal regulators, as well as dissemination for public use on the BDCP Implementation Office website. The monitoring program will also cover identified data needs to monitoring restoration actions.

#### 3B.4.27.2.2 Restoration

For each tidal restoration project, a project-specific selenium management evaluation (or plan, as needed) will be developed to evaluate the likelihood that BDCP actions would result in increased selenium entering the foodweb. The plan would specify measures to minimize the conditions known

to support mobilization of selenium, and monitoring programs, if required. Each project-specific evaluation will include the following components:

1. A brief review of available information to determine the likelihood that elevated levels of selenium and supportive biogeochemical conditions are present; projects within the South Delta and Suisun Marsh would likely be candidates
2. A brief review of predicted changes in water residence time and increasing reducing conditions at the project site that could promote mobilization of selenium into fish and invertebrates
3. Based on results of Steps 1 and 2 above, a determination if preconstruction sampling for characterization of selenium concentrations is warranted to determine if selenium is elevated under pre-restoration conditions
4. Development and implementation of a project-specific plan for conducting sampling for pre-restoration characterization, if warranted
5. Re-evaluation of the likelihood that the project could result in selenium mobilization, and recommendations for restoration design elements and post-construction monitoring to address those risks

#### ***Design Elements to Minimize Selenium Mobilization***

Under this AMM, DWR will evaluate site-specific restoration conditions and design elements that could minimize conditions conducive to increases of bioavailable selenium in restored areas. The design elements will be integrated into site-specific restoration designs based on site conditions, community type (tidal marsh, nontidal marsh, floodplain), and potential organic forms of selenium in water. The overall ecosystem restoration objectives will be considered throughout the process so that any mitigation does not interfere with these objectives.

Currently, there are no proven methods for mitigating selenium mobilization at restoration sites, and current research results will be consulted when implementing this program. Given our current understanding of selenium biogeochemistry, the design minimization measures will be focused on providing oxidizing conditions, minimizing residence times and maximizing flows.

One approach may be to limit the concentration of organics in the top layers of sediment and also within the water column. However, removal of organics may often be counter to the intent of the restoration project and would need to be considered within the larger context of objectives. Increased flows may also be an attractive option to limit selenium mobilization.

#### ***Adaptive Management***

Adaptive management will be implemented when post-restoration monitoring results indicate that project activities have resulted in increased bioavailability of selenium. The action levels for adaptive management will be identified in the Selenium Monitoring Plan.

### **3B.4.27.3 Schedule**

AMM27 provides specific tidal natural communities restoration design elements to reduce the potential for bioaccumulation of selenium and its bioavailability in tidal habitats. Consequently, this mitigation would be implemented as part of the tidal natural communities restoration design schedule.

#### 3B.4.27.4 Oversight and Coordination

DWR will identify a qualified specialist in selenium cycling and biological effects who will oversee all aspects of implementing AMM27. The appointed selenium specialist will review and approve all conclusions and recommendations generated from this program, and will develop a Quality Assurance/Quality Control program to cover all sampling, analysis and reporting under the program. The specialist will also be responsible for integrating new, relevant information generated by research over the course of this program.

#### 3B.4.27.5 Timing and Phasing

The selenium monitoring program to track potential changes to selenium concentrations will be developed prior to implementation of water operations.

**Explanation of effectiveness:** This AMM, along with Environmental Commitment 12 (CM12 under the BDCP alternatives), provides specific tidal habitat restoration design elements to reduce the potential for bioaccumulation of selenium and its bioavailability in tidal habitats. Furthermore, the effectiveness of selenium management to reduce selenium concentrations and/or bioaccumulation would be evaluated separately for each restoration effort as part of design and implementation.

Selenium toxicity in avian species can result from the mobilization of naturally high concentrations of selenium in soils (Ohlendorf and Heinz 2009) and covered activities have the potential to exacerbate bioaccumulation of selenium in avian species, such as California black rail, California clapper rail, California least tern, Greater and Lesser sandhill crane, least bittern and white-faced ibis. Marsh (tidal and nontidal) and floodplain restoration have the potential to mobilize selenium, and therefore increase avian exposure from ingestion of prey items with elevated selenium levels. Thus, project-related restoration activities that create newly inundated areas could increase bioavailability of selenium. Because of the uncertainty that exists at this programmatic level of review, there could be a substantial effect on avian species and habitat from increases in selenium associated with restoration activities.

Longer water residence times in restoration areas could also make selenium more bioavailable to Sacramento splittail, but Delta-relevant information is limited to assess this risk. It is anticipated that any potential effects of selenium on Sacramento splittail would be addressed through implementation of AMM27 and Environmental Commitment 12 (CM12).

In the absence of AMM27 and Environmental Commitment 12 (CM12), increases in selenium could lead to significant impacts.

#### 3B.4.28 AMM28 Geotechnical Studies

Detailed subsurface investigations will be performed at the locations of the water conveyance alignment and facility locations and at material borrow areas. The main geotechnical issues in the Delta include stability of canal embankments and levees, liquefaction of Delta soils (particularly loose, saturated sands), seepage through coarse-grained soils, settlement of embankments and structures, subsidence, and soil-bearing capacity. The work to be performed will include a subsurface investigation program to provide the information required to support the design and construction of the water conveyance facilities. Appropriate geotechnical investigations will be conducted to identify the types of soil avoidance or soil stabilization measures that should be implemented to ensure that the facilities are constructed to withstand subsidence and settlement

and to conform to applicable state and federal standards. The geotechnical investigation will also include a small-scale environmental screening to assess the presence or absence of dissolved gases, which will help guide the tunnel ventilation design and disposal considerations for excavated materials and tunnel cuttings.

Site-specific geotechnical studies are expected to include the following, as appropriate.

- Assess liquid limit (i.e., the moisture content at which a soil passes from a solid to a liquid state) and organic material on soil samples collected during site-specific field investigations to determine site-specific geotechnical properties.
- Drill and sample soil borings, cone penetration, and other *in situ* tests, slug tests, aquifer/pumping tests, and test pits to evaluate the subsurface conditions.
- Install wells and monitor groundwater elevations for use in liquefaction evaluation and dewatering requirements.
- Perform geotechnical laboratory testing on selected soil samples to evaluate engineering properties of the soils encountered in the borings.
- Prepare geotechnical data reports to document the results of the subsurface investigations, geotechnical baseline reports to describe expected construction conditions, and geotechnical interpretive reports to specify design and construction recommendations. Recommendations will be made based on the conclusions of these reports.

**Explanation of effectiveness:** Design-level geotechnical studies would be prepared by a geotechnical engineer licensed in the state of California during project design. The studies would assess site-specific conditions at and near all the project facility locations, including seismic activity, soil liquefaction, and other potential geologic and soil-related hazards. This information would be used to verify assumptions and conclusions included in the EIR/EIS. The geotechnical engineer's recommended measures to address adverse conditions would conform to applicable design codes, guidelines, and standards. Potential design strategies or conditions could include avoidance (deliberately positioning structures and lifelines to avoid crossing identified shear rupture zones), geotechnical engineering (using the inherent capability of unconsolidated geomaterials to "locally absorb" and distribute distinct bedrock fault movements) and structural engineering (engineering the facility to undergo some limited amount of ground deformation without collapse or significant damage).

In absence of the implementation of AMM28, there would be a greater potential for significant impacts related to geology and seismicity, soils, and groundwater from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### 3B.4.29 AMM29 Design Standards and Building Codes

DWR will ensure that the standards, guidelines, and codes listed below (or the most current applicable version at the time of implementation), which establish minimum design criteria and construction requirements for project facilities, will be followed by project engineers. The engineers will also follow any other standards, guidelines, and code requirements, not listed below, that are promulgated during the detailed design and construction phases and during operation of the water conveyance facilities. DWR will also ensure that the design specifications are properly executed during construction. The minimum design and construction requirements act as performance standards for engineers and construction contractors. Because the design and construction

parameters of these codes and standards are intended to reduce the potential for structural damage or risks to human health due to the geologic and seismic conditions that exist within the Plan Area and the surrounding region, as well as climate change, an uncontrolled release of water, a flood event, and accidents during construction, their use is considered an environmental commitment of DWR. These standards, guidelines, and codes include the following.

- CCR Title 8.
- DWR Division of Flood Management *FloodSAFE Urban Levee Design Criteria*, May 2012.
- State of California Sea-Level Rise Task Force of the Coastal and Ocean Working Group of the California Climate Action Team, *Sea-Level Rise Interim Guidance Document*, 2010.
- USACE (CESPK-ED-G), *Geotechnical Levee Practice*, SOP EDG-03, 2004.
- USACE *Design and Construction of Levees*, EM 1110-2-1913, 2000.
- USACE *Engineering and Design—Structural Design and Evaluation of Outlet Works*, EM 1110-2-2400, 2003.
- USACE *Slope Stability*, EM 1110-2-1902, 2003.
- USACE *Engineering and Design—Settlement Analysis*, EM 1110-1-1904, 1990.
- USACE *Engineering and Design—Design of Pile Foundations*, EM 1110-2-2906, 1991.
- U.S. Department of the Interior and U.S. Geological Survey *Climate Change and Water Resources Management: A Federal Perspective*, Circular 1331.

**Explanation of effectiveness:** This AMM, along with its corresponding environmental commitment (described under Section 3B.2.2, *Conform with Applicable Design Standards and Building Codes*) would avoid significant impacts related to groundwater, geology and seismicity, and soils, involving potential risk of personal injury, death, structural damage, or loss of property by meeting building codes and design standards. In the absence of compliance with these building codes, design standards, and health and safety requirements, the risks associated with personal injury, death or loss of property as a result of construction activities would be higher, which could result in a significant impact. Refer to Section 3B.2.2 for more details.

### 3B.4.30 AMM30 Transmission Line Design and Alignment Guidelines

The location and design of the proposed new transmission lines will be conducted in accordance with electric and magnetic field guidance adopted by the California Public Utilities Commission (2006) *EMF Design Guidelines for Electrical Facilities*. The guidelines describe the routine magnetic field reduction measures that all regulated California electric utilities will consider for new and upgraded transmission line and transmission substation construction.

The alignment of proposed transmission lines will be designed to avoid sensitive terrestrial and aquatic habitats when siting poles and towers, to the maximum extent feasible. Lines will be co-located where feasible, when such co-location would minimize effects on greater sandhill cranes and other sensitive resources. In cases where this is not feasible, DWR will ensure that impacts are minimized to the greatest degree feasible, and disturbed areas will be returned as near as reasonably and practically feasible to preconstruction conditions, by reestablishing surface conditions through carefully grading, reconstructing features such as irrigation and drainage

facilities, and replanting vegetation and crops and/or compensating farmers for crops losses. Temporary transmission lines will be designed to avoid removal of wetted acres of vernal pools and alkali seasonal wetlands. Transmission lines will avoid greater sandhill crane roost sites as described in AMM20.

Further, tower and pole placement will avoid existing structures to the extent feasible. Where poles or towers are to be constructed in agricultural areas, the following BMPs will be implemented, as applicable and feasible.

- Use single-pole structures instead of H-frame or other multiple-pole structures to reduce the potential for land impacts and minimize weed encroachment issues.
- Locate new transmission lines along existing transmission line corridors to the extent feasible.
- Use special transmission designs to span existing irrigation systems or, if necessary, reconfigure the irrigation system at the utilities' expense, if feasible.

**Explanation of effectiveness:** During construction of transmission lines, the proposed project could result in the direct loss of vernal pool complex natural community and adversely affect several special-status species that occur there as well as affect other special-status species. The loss of habitat and effects on special-status species would be significant impacts in the absence of the restoration and protection of this natural community, and the implementation of AMM1-AMM6, AMM10, and AMM30. AMM30 would be available to guide the design of transmission lines and the selection of routes to minimize effects to terrestrial biological resources to the maximum extent feasible.

In absence of the implementation of AMM30, there would be a greater potential for significant impacts on vernal pool complexes and special status species, due to loss of habitat and presence of new transmission lines in sensitive areas. Refer to the impact analyses for each resource for more detail.

### 3B.4.31 AMM31 Noise Abatement

In addition to implementing *AMM9 Underwater Sound Control and Abatement Plan*, DWR and contractors hired to construct any components of the water conveyance facilities will implement a noise abatement plan to avoid or reduce potential in-air noise impacts related to construction, maintenance, and operations. As applicable, the following components will be included in the plan.

#### 3B.4.31.1 Construction and Maintenance Noise

- To the extent feasible, the contractor will employ best practices to reduce construction noise, particularly during daytime and evening hours (7:00 a.m. to 10:00 p.m.) such that construction noise levels do not exceed 60 dBA  $L_{eq}$  (1 hour) at the nearest residential land uses.
- Limit construction during nighttime hours (10:00 p.m. to 7:00 a.m.) such that construction noise levels do not exceed 50 dBA  $L_{max}$  at the nearest residential land uses.
- Limit pile driving to daytime hours (7 a.m. to 7 p.m.).
- In the event that construction noise during nighttime hours exceeds 50 dBA  $L_{max}$ , the construction contractor will cease nighttime construction activity in the area until sound-attenuating mitigation measures, such as temporary sound walls, are implemented, such that nighttime construction noise is reduced to a level of 50 dBA  $L_{max}$  or lower.



- Employ preventive maintenance including practicable methods and devices to control, prevent, and minimize noise.
- Route truck traffic to reduce construction noise impacts and traffic noise levels on noise-sensitive resources.
- To the extent feasible, schedule construction activities so that the loudest noise events, such as blasting, occur during peak traffic commute hours.
- Limit offsite trucking activities (e.g., deliveries, export of materials) to minimize impacts.
- See also AMM20 for requirements related to noise for projects in the greater sandhill crane winter use area.

### 3B.4.31.2 Operation Noise

Pump station facilities will be designed and constructed such that facility operation noise levels do not exceed 50 dB  $L_{eq}$  during daytime and evening hours (7:00 a.m. to 10:00 p.m.) and 45 dBA  $L_{eq}$  during nighttime hours (10 p.m. to 7 a.m.). Acoustical measures such as terrain shielding, pump enclosures, and acoustical building treatments will be incorporated into the facility design to meet this performance standard.

**Explanation of effectiveness:** This AMM, along with its corresponding environmental commitment, described in Section 3B.2.11, *Develop and Implement Noise Abatement Plan*, would be implemented to minimize impacts of construction-related noise and groundborne vibration levels on sensitive land uses and wildlife. For more information regarding the effectiveness of this AMM, see Section 3B.2.11.

### 3B.4.32 AMM32 Hazardous Material Management

DWR will ensure that each construction contractor will develop and implement an HMMP before beginning construction. It is anticipated that multiple HMMPs will be prepared for the overall construction activities, each taking into account site-specific conditions such as hazardous materials present onsite and known historical site contamination. A database on historical instances of contamination and results of any field inspections regarding the presence of hazardous chemicals will be maintained. The HMMPs will provide detailed information on the types of hazardous materials used or stored at all sites associated with the water conveyance facilities (e.g., intake pumping plants, maintenance facilities); phone numbers of applicable city, county, state, and federal emergency response agencies; primary, secondary, and final cleanup procedures; emergency-response procedures in case of a spill; and other applicable information. The HMMPs will include appropriate practices to reduce the likelihood of a spill of toxic chemicals and other hazardous materials during construction and facilities operation and maintenance. A specific protocol for the proper handling and disposal of hazardous materials will be established before construction activities begin and will be enforced by DWR.

The HMMPs will include, but not be limited to, the following measures or practices.

- Fuel, oil, and other petroleum products will be stored only at designated sites.
- Hazardous materials containment containers will be clearly labeled with the identity of the hazardous materials contained therein, handling and safety instructions, and emergency contact.

- Storage, use, or transfer of hazardous materials in or near wet or dry streams will be consistent with California Fish and Game Code Section 5650 and/or with the permission of CDFW.
- Material Safety Data Sheets will be made readily available to the contractor's employees and other personnel at the work site.
- The accumulation and temporary storage of hazardous wastes will not exceed 90 days.
- Soils contaminated by spills or cleaning wastes will be contained and removed to an approved disposal site.
- Hazardous waste generated at work sites, such as contaminated soil, will be segregated from other construction spoils and properly handled, hauled, and disposed of at an approved disposal facility by a licensed hazardous waste hauler in accordance with state and local regulations. The contractor will obtain permits required for such disposal.
- Emergency spill containment and cleanup kits will be located at the facility site. The contents of the kit will be appropriate to the type and quantities of chemical or goods stored at the facility.

**Explanation of effectiveness:** This AMM, along with its corresponding environmental commitment, described in Section 3B.2.12, *Develop and Implement Hazardous Materials Management Plans*, would be implemented to minimize impacts of improper storage, and handling and use of hazardous materials that could result in releases of hazardous materials and associated effects/impacts on the public and the environment. Significant impacts on fish species, long-term recreational fishing opportunities and associated direct and indirect changes in community character from hazardous spills would be minimized, as would the demand for emergency or fire services. See Section 3B.2.12 for more information.

### 3B.4.33 AMM33 Mosquito Management

To aid in mosquito management and control during construction of project facilities, DWR will consult with appropriate mosquito and vector control districts. Consultation will occur before the sedimentation basins, solids lagoons, and the intermediate forebay inundation area become operational. Once these components are operational, DWR will consult again with the mosquito and vector control districts to determine if mosquitoes are present in these facilities, and implement mosquito control techniques as applicable. These techniques will include, but not be limited to, the following.

- Test for mosquito larvae during the high mosquito season (June through September).
- Introduce biological controls, such as mosquito fish, to sedimentation basins, solids lagoons, and the intermediate forebay inundation area.
- Introduce physical controls (e.g., discharging dewatered water more frequently or increasing circulation) to sedimentation basins, solids lagoons, and the intermediate forebay inundation area.
- To aid in vector management and control, the construction contractors, with Implementation Office approval, will develop mosquito management plans, in consultation with appropriate mosquito and vector control districts, for designing and planning restoration and conservation activities. These include the districts of Alameda County, Contra Costa, Sacramento-Yolo, San Joaquin County, and Solano County. Consultation will include, but not be limited to, reviews of mosquito management plans and BMPs to be implemented at the restoration sites, reviews of

proposed mosquito monitoring efforts at restoration sites, and assistance with monitoring efforts where feasible. The Central Valley Joint Venture's *Technical Guide to Best Management Practices for Mosquito Control in Managed Wetlands* (Kwasny et al. 2004) and other guidelines will be used to help design appropriate restoration and conservation features to the extent feasible consistent with the biological goals and objectives. The mosquito management plans will address wetland design considerations, water management practices, vegetation management, biological controls, and wetland maintenance. BMPs will include, but not be limited to, the following.

- Implement delayed or phased fall flooding—phased flooding involves flooding habitat throughout the fall and winter in proportion to wildlife needs and takes into consideration other wetland habitat that may be available in surrounding areas.
- Implement rapid fall flooding.
- Maintain stable water levels.
- Circulate water.
- Use deep initial flooding.
- Apply subsurface irrigation.
- Use water sources with mosquito predators for flooding.
- Drain irrigation water into ditches or other water bodies with abundant mosquito predators.
- Employ vegetation management practices to reduce mosquito production in managed wetlands (e.g., mowing, burning, disking of vegetation that serves as mosquito breeding substrate).
- Design wetlands and operations to be inhospitable to mosquitoes.
- Implement monitoring and sampling programs to detect early signs of mosquito population problems.
- Use biological agents such as mosquito fish to limit larval mosquito populations.
- Use larvicides and adulticides, as necessary. If larvicides and adulticides are used, the effects of these chemicals would need to be evaluated and a monitoring program established to evaluate effects, if any, that application would have on macroinvertebrates and associated covered fish and wildlife species.

Implementation of these BMPs will reduce the likelihood that project operations will require an increase in abatement activities by local mosquito vector and control districts.

***Explanation of effectiveness:*** This AMM, along with its corresponding environmental commitment, described in Section 3B.2.15, *Prepare and Implement Mosquito Management Plans*, would be implemented to minimize impacts of mosquito-related vector borne diseases, which would be a significant public health impact. See Section 3B.2.15 for more information.

### 3B.4.34 AMM34 Construction Site Security

All security personnel will receive environmental training similar to that of onsite construction workers so that they understand the environmental conditions and issues associated with the

various areas for which they are responsible at a given time. Security operations and field personnel will be given the emergency contact phone numbers of environmental response personnel for rapid response to environmental issues resulting from vandalism or incidents that occur when construction personnel are not onsite. Security operations will also maintain a contact list of backup support from city police, county sheriffs, California Highway Patrol, water patrols (such as the Contra Costa County Marine Patrol), helicopter response, and emergency response (including fire departments, ambulances/emergency medical technicians). The appropriate local and regional contact list will be made available to security personnel by DWR, as will the means to make that contact via landline phones, cell phones, or radios.

**Explanation of effectiveness:** This AMM, along with its corresponding environmental commitment, described in Section 3B.3.5, *Provide Construction Site Security*, would be implemented to minimize impacts to law enforcement and public service demands, as well as reduce potential for hazardous spills and fires, which would be significant impacts. See Section 3B.3.5 for more information.

### 3B.4.35 AMM35 Fugitive Dust Control

DWR will implement basic and enhanced control measures at all construction and staging areas to reduce construction-related fugitive dust. Although the following measures are outlined in the Sacramento Metropolitan Air Quality Management District's California Environmental Quality Act guidelines, they are required for the entirety of the construction area, including areas within the Bay Area Air Quality Management District, San Joaquin Valley Air Pollution Control District, and Yolo Solano Air Quality Management District, and are sufficient to address fugitive dust control requirements of these three districts. DWR will ensure the project commitments are appropriately implemented before and during construction, and that proper documentation procedures are followed. DWR will take steps to ensure that the following measures will be implemented to the extent feasible to control dust during general construction activities.

- Apply water to all exposed surfaces as reasonably necessary to prevent visible dust from leaving work areas. Increase frequency during especially dry or windy periods or in areas with a lot of construction activity. Exposed surfaces include (but are not limited to) soil piles, graded areas, unpaved parking areas, staging areas, and access roads.
- Cover or maintain at least 2 feet of freeboard space on haul trucks transporting soil, sand, or other loose material on the site. Any haul trucks that will be traveling along freeways or major roadways should be covered.
- Use wet power vacuum street sweepers to remove any visible trackout mud or dirt onto adjacent public roads at least once a day. Use of dry power sweeping is prohibited.
- Limit vehicle speeds on unpaved roads to 15 miles per hour.
- All roadway, driveway, sidewalk, and parking lot paving should be completed as soon as possible. In addition, building pads should be laid as soon as possible after grading unless seeding or soil binders, or other reasonable mitigation measures are used.
- Water exposed soil with adequate frequency for continued moist soil; however, do not overwater to the extent that sediment flows off the site.
- Suspend excavation, grading, and/or demolition activity when wind speeds exceed 20 miles per hour.

- 1 • Install wind breaks (e.g., plant trees, solid fencing) on windward side(s) of construction areas.
- 2 • Plant vegetative ground cover (fast-germinating native grass seed) in disturbed areas as soon as
- 3 possible after construction is completed. Water appropriately until vegetation is established.
- 4 • Install wheel washers for all exiting trucks, or wash off all exiting trucks and equipment before
- 5 leaving the site.
- 6 • Treat site accesses to a distance of 100 feet from the paved road with a 6- to 12-inch layer of
- 7 wood chips, mulch, or gravel to reduce generation of road dust and road dust carryout onto
- 8 public roads.
- 9 • Post a publicly visible sign with the telephone number and person to contact at the lead agency
- 10 regarding dust complaints. This person will respond and take corrective action within 48 hours.
- 11 The phone number of the district will also be visible to ensure compliance.

12 **Explanation of effectiveness:** This AMM would be implemented to reduce impacts related to  
 13 aesthetics, air quality, and environmental justice due to construction of the project conveyance  
 14 facilities and restoration areas, particularly near those sites that require substantial earthmoving  
 15 activities or site grading. This AMM would implement basic and enhanced fugitive dust control  
 16 measures, such as regular watering, to help reduce the creation of dust clouds that would cause  
 17 significant impacts. Aesthetic impacts include negatively affecting short-range views; however, this  
 18 AMM, along with its corresponding environmental commitment and other mitigation measures,  
 19 would still not reduce impacts fully, and impacts related to visual quality or character would remain  
 20 significant and unavoidable. Regular watering and implementation of other fugitive dust control  
 21 measures would also reduce dusty conditions and therefore reduce the risk of exposing sensitive  
 22 receptors to Valley Fever and to other health hazards from localized particulate matter in excess of  
 23 air quality district health-based concentration thresholds.

24 In absence of the implementation of AMM35, mitigation measures, and other AMMs, there would be  
 25 a greater potential for significant impacts on sensitive receptors from construction and/or operation  
 26 of the proposed project. Refer to the impact analyses for each resource for more detail.

### 27 **3B.4.36 AMM36 Notification of Activities in Waterways**

28 Similar to the requirements specified in the *AMM7 Barge Operations Plan*, *AMM8 Fish Rescue and*  
 29 *Salvage Plan*, and *AMM9 Underwater Sound Control and Abatement Plan*, AMM36 requires DWR to  
 30 ensure notification of appropriate fish and wildlife agency representatives before in-water  
 31 construction or maintenance activities begin, when these activities could affect water quality or  
 32 aquatic species. The notification procedures will follow stipulations included in applicable permit  
 33 documents for the construction operations. However, in general, the notification information will  
 34 include site location(s), schedules, and work activities. Information on detours would include site-  
 35 specific details regarding any temporary partial channel closures, including contacting the U.S. Coast  
 36 Guard, boating organizations, marina operators, city or county parks departments, and the  
 37 California Department of Pesticide Regulation, where applicable.

38 **Explanation of effectiveness:** This AMM would be implemented to reduce impacts on fish in the  
 39 vicinities of in-water construction or maintenance activities. This AMM would notify fish and wildlife  
 40 agencies to alert them of sites, schedules, and activities. This AMM, along with AMMs 7, 8, and 9, and  
 41 environmental commitment 3B.2.8, would reduce impacts on fish species from construction and  
 42 maintenance activities. It is not likely that implementation of this AMM alone would ensure less-

than-significant construction-related impacts on fish. In absence of the implementation of AMM35, mitigation measures, and other AMMs, there would be a greater potential for significant impacts on fish species from construction and/or operation of the proposed project. Refer to the impact analyses for fish and aquatic resources for more detail.

### 3B.4.37 AMM37 Recreation

The following avoidance and minimization measures will be implemented for recreational use within the reserve system for the BDCP alternatives. For additional conditions related to recreational use, see *CM11 Natural Communities Enhancement and Management* (Section 3B.5.8). Rare exceptions to the measures listed below will be considered and approved by DWR and the fish and wildlife agencies on a case-by-case basis. Exceptions will be approved only if they are consistent with the biological goals and objectives. Any exceptions will be clearly identified in the recreation plan described in CM11.

#### 3B.4.37.1 General Recreation-Related Avoidance and Minimization

The following measures are related to construction of trails and other recreational facilities.

- Trails will be sited and designed with the smallest footprint necessary to cross through the instream area. Trails will be designed to avoid any potential for future erosion. New trails that follow stream courses will be sited outside the riparian corridor. Trails that follow stream courses will have designated stream access points for fishing if allowed.
- Construction of trails and other recreation amenities in riparian areas will be limited to outside the breeding season for nesting birds.
- The recreational facility will be designed to avoid the removal of riparian vegetation or wetlands.
- The number and length of trails that parallel the edge of the riparian forest and tidal marsh will be limited unless located sufficiently away from those communities to minimize disturbance and allow use of open habitats by edge-dependent species. When adjacent to riparian or tidal marsh communities, trails will be on the top of a levee or behind the top of bank except where topographic, resource management, or other constraints or management objectives make this not feasible or undesirable.
- New trails in vernal pool or alkali seasonal wetland complexes and grasslands with stock ponds will be sited at least 250 feet from wetland features, or may be sited closer based on the site's microtopography to ensure the trail does not adversely affect the local watershed surrounding a wetland feature. Existing trails may be used in the vicinity of vernal pools and alkali seasonal wetland features provided they are maintained to prevent erosion and do not encroach into the wetland features.
- Existing access routes and levee roads will be used, if available, to minimize impacts of construction in special-status species habitats and riparian zones.
- Trails in areas of moderate or difficult terrain and adjacent to a riparian zone will be composed of natural materials or will be designed (e.g., a bridge or boardwalk) to minimize disturbance and need for drainage structures, and to protect water quality.

The following measures are related to siting recreation facilities in relation to biological resources.

- Recreational uses in the reserve system will be designed to minimize impacts on biological resources.
- Recreation will only be allowed where it is compatible with the biological goals and objectives.
- Recreational use and impacts will be monitored by DWR to ensure that uses do not substantially and adversely affect covered species. If any use is found to have substantial adverse effects on covered species, that use will be discontinued until adjustments in the use can be made to reduce or eliminate impacts.
- Allowable recreational uses will be controlled and restricted by area and time to minimize impacts on natural communities and covered species and to ensure that the biological goals and objectives. For example, trails will be closed during and immediately following heavy rains and annually winterized to minimize erosion and sedimentation.
- Activities will be allowed in keeping with the ecological needs of the given habitat. Any off-trail activities and other active recreation not listed as allowed in CM11 (e.g., outdoor sports, geocaching), unless otherwise authorized by DWR, are prohibited. Recreational uses will be allowed only during daylight hours and designated times of the year (i.e., limited seasonal closures to protect sensitive covered species; see below for specific examples) unless authorized through a use permit (i.e., backpacking). Exceptions may be made for educational groups and events that are guided by an Implementation Office staff person or docent approved by DWR.
- New staging areas will be developed to the extent feasible in areas within reserves that are already disturbed and not suitable for habitat restoration, and that do not contribute to the biological goals and objectives. Sites at the edges of reserves will be chosen over sites on the interior of reserves.
- No motorized vehicles will be allowed in reserves, except on designated recreational access roads and for use by the reserve manager staff or with the prior approval of the reserve manager (e.g., contractors implementing BDCP actions such as habitat restoration and monitoring, grazing tenants, fire-suppression personnel, and maintenance contractors). For reserves under conservation easements, vehicle use will be allowed as part of the regular use of the land (e.g., agricultural operations, permanent residents, utilities, police and fire departments, other easement holders), as specified in the easement.
- When compatible with the biological goals and objectives, dogs may be allowed during daylight hours in designated reserves or in designated areas of reserves, but only on leash. Leash law restrictions will be strictly enforced by reserve managers and staff because of the potential impact of dogs on covered species such as San Joaquin kit fox, western burrowing owl, California red-legged frog, and California tiger salamander. Leash enforcement may include citations and fines. Dogs used for herding purposes by grazing lessees or for hunting must be under verbal control and have proof of vaccination.
- Picnic areas will be operated during daylight hours only. No irrigated turf or landscaping will be allowed in picnic areas. To the extent feasible, picnic areas will be located on the perimeter of reserves and will be sited in already disturbed areas. No private vehicles will be allowed in picnic areas, unless the picnic area is at a staging area and except for limited special events approved by DWR. Maintenance and emergency vehicles will be permitted access to picnic areas.

- Backpack camps will be limited to use by no more than 25 people at each site. In coordination with the reserve manager, DWR will monitor use and maintenance of backpack camps and may implement a reservation and permitting process for use of backpack camps.
- Public collecting of native species will be prohibited within reserves.
- Introduction of domestic or feral animals, including cats, ducks, fish, reptiles, and any exotic nonnaturalized species, is prohibited within the reserves to prevent interference with and mortality of native species, except by the reserve manager for management purposes (e.g., livestock for grazing or dogs for livestock control or protection).
- Recreational uses will be controlled using a variety of techniques including fences, gates, clearly signed trails, educational kiosks, trail maps and brochures, interpretive programs, and patrol by land management staff.
- Construction of recreational facilities within reserves will be limited to those structures necessary to directly support the authorized recreational use of the reserve. Existing facilities will be used where possible. Facilities that support recreation and that may be compatible with the reserve include parking lots (e.g., small gravel or paved lots), trails (unpaved or paved as required by law), educational and informational kiosks, up to one visitor center located in a disturbed or nonsensitive area, and restroom facilities located and designed to have minimal impacts on habitat. Playgrounds, irrigated turf, off-highway vehicle trails, and other facilities that are incompatible with the biological goals and objectives will not be constructed.
- Signs and informational kiosks will be installed to inform recreational users of the sensitivity of the resources in the reserve, the need to stay on designated trails, and the danger to biological resources of introducing wildlife or plants into the reserve.
- When compatible with the biological goals and objectives, recreation plans for reserves adjacent to existing conservation lands (non-BDCP) will try to ensure consistency in recreational uses across open-space boundaries to minimize confusion for the public. Reserves adjacent to existing conservation lands (non-BDCP) with different recreational uses will provide clear signage to explain these differences to users that cross boundary lines. DWR will be responsible for securing and signing reserve boundaries.

### 3B.4.37.2 Measures Specific to Natural Communities and Covered Species

#### 3B.4.37.2.1 Grassland, Alkali Seasonal Wetland Complex, and Vernal Pool Complex Natural Communities

The following measures will be implemented to avoid and minimize effects on covered species in the grassland, alkali seasonal wetland complex, and vernal pool complex natural communities.

- **San Joaquin kit fox.** New trails will be prohibited within 250 feet of active kit fox dens. Trails will be closed within 250 feet of active natal/pupping dens until young have vacated, and within 50 feet of other active dens. No dogs will be allowed on properties with active kit fox populations. Rodent control will be prohibited even on grazed or equestrian-access areas with kit fox populations.
- **Western burrowing owl.** New trails will be prohibited within 250 feet of active western burrowing owl nests. If an owl pair nests within 250 feet of an active trail, Implementation Office staff will consult with the fish and wildlife agencies to determine the appropriate action to



take. Actions may include prohibiting trail use until young have fledged and are no longer dependent on the nest. Leash laws will be enforced. Rodent control will be prohibited even on grazed or equestrian-access areas with burrowing owl populations, except where necessary to protect important infrastructure.

- **California red-legged frog, California tiger salamander.** New trails will be prohibited within 100 feet of wetlands and streams that provide suitable habitat for covered amphibians, unless topography or other landscape characteristics shield these trails from the covered species habitat or a lack of effect of the trail on the species can be otherwise demonstrated.
- **Plants (brittlescale, Carquinez goldenbush, delta button celery, heartscale, San Joaquin spearscale).** New trails will avoid populations of these species. Trails will be closed if they would potentially affect populations.
- **Vernal pool and alkali seasonal wetland crustaceans and plants.** No new trail construction will be allowed in vernal pool or alkali seasonal wetland features.

### 3B.4.37.2.2 Riparian Natural Community

The following measures will be implemented to avoid and minimize effects on covered species in the riparian natural community, in addition to the general measures related to riparian areas described in Section 3B.4.37.1.

- **Least Bell's vireo, yellow-breasted chat, western yellow-billed cuckoo.** Construction in and near riparian areas will be limited to outside of the breeding season.
- **Swainson's hawk, white-tailed kite.** Construction in and near riparian areas will be limited to outside of the breeding season. During breeding season, trails will be closed within 600 feet of active nests.
- **Plants (delta mudwort, delta button celery, Delta tule pea, Mason's lilaeopsis, side-flowering skullcap, slough thistle, Suisun marsh aster).** New trails will avoid populations of these species. Trails will be closed if they would potentially affect populations. Fishing areas will be designated to focus public use along waterways.

### 3B.4.37.2.3 Cultivated Lands

The following measures will be implemented to avoid and minimize effects on covered species on cultivated lands.

- **Swainson's hawk.** Construction within 600 feet of potential nest trees will be limited to outside of the breeding season. During the breeding season, trails will be closed within 600 feet of active nests.
- **Greater sandhill crane roost sites.** Construction will be limited to spring and summer (outside of the crane wintering season). No hunting will be allowed at sites with temporary or permanent crane roosts. Where feasible, no fall or winter hunting will be allowed on adjacent fields. Recreation on sites with crane roosts will be limited to public roadways and overlook areas. No pets will be allowed onsite.

#### 3B.4.37.2.4 Managed Wetlands

The following measures will be implemented to avoid and minimize effects on covered species in the managed wetland natural community, in addition to the general measures related to wetlands described in Section 3B.4.37.1.

- **Greater sandhill crane (on sites within greater sandhill crane winter use area where wetlands are managed specifically for crane).** Construction will be limited to spring and summer (outside of the wintering season). No hunting will be allowed at sites with temporary or permanent crane roosts. Where feasible, no fall or winter hunting will be allowed on adjacent fields. Recreation on sites with crane roosts will be limited to public roadways and overlook areas. No pets will be allowed onsite.
- **California black rail, California clapper rail.** Construction in and near suitable habitat will be limited to outside of the breeding season. Trails will be limited to levees. No pets will be allowed onsite during the breeding season and leash laws will be enforced outside of the breeding season (excluding hunting activities).
- **Salt marsh harvest mouse.** Trails will be limited to levees. Leash laws will be enforced (excluding hunting activities).

#### 3B.4.37.2.5 Tidal Brackish Emergent Wetlands and Tidal Freshwater Emergent Wetland Natural Communities

The following measures will be implemented to avoid and minimize effects on covered species in the tidal brackish emergent wetland and tidal freshwater emergent wetland natural communities, in addition to the general measures related to wetlands described in Section 3B.4.37.1.

- **California black rail, California clapper rail.** Construction in and near suitable habitat will be limited to outside of the breeding season. Trails will be limited to levees and upland areas. No pets will be allowed onsite during the breeding season, and leash laws will be enforced outside of the breeding season (excluding hunting activities).
- **Suisun song sparrow.** Trails will be limited to levees or upland areas. No pets will be allowed onsite during the breeding season, and leash laws will be enforced outside of the breeding season (excluding hunting activities).
- **Salt marsh harvest mouse.** Trails will be limited to levees or upland areas. No pets will be allowed onsite during the breeding season, and leash laws will be enforced outside of the breeding season (excluding hunting activities).
- **Plants (delta mudwort, Delta tule pea, Mason's lilaeopsis, soft bird's-beak, Suisun marsh aster, Suisun thistle).** New trails will avoid populations of these species. Trails will be closed if they would potentially affect populations. Fishing areas along sloughs will be designated to focus public use along waterways.
- **All tidal species.** Signs will be added adjacent to tidal preserves asking boaters to slow down when passing to minimize the effects of noise and wakes on species that utilize the marsh edge.

### 3B.4.37.2.6 Nontidal Perennial Aquatic and Nontidal Freshwater Emergent Wetland Natural Communities Natural Communities

The following measures will be implemented to avoid and minimize effects on covered species in the nontidal perennial aquatic and nontidal freshwater emergent wetland natural communities, in addition to the general measures related to wetlands described in Section 3B.4.37.1.

- **Tricolored blackbird.** New trails will be prohibited within 100 feet of wetlands that provide suitable habitat for breeding tricolored blackbirds, unless topography or other landscape characteristics shield these trails from the habitat or a lack of effect of the trail on the species can be otherwise demonstrated. Leash laws will be enforced. Trails will be closed within 250 feet of active nesting colonies until it can be demonstrated that the nesting cycle has completed.
- **Giant garter snake.** New trails will be prohibited within 100 feet of nontidal wetlands that are restored for giant garter snake, unless topography or other landscape characteristics shield these trails from the habitat or a lack of effect of the trail on the species can be otherwise demonstrated. Leash laws will be enforced. Rodent control will be prohibited on adjacent grassland uplands, except where necessary to protect important infrastructure.

**Explanation of effectiveness:** Under the BDCP alternatives, AMM37 would be available to avoid and minimize the effects from the construction, management, and operation of recreation facilities and activities on reserve lands. The measures ensure, where recreational activities are allowed on BDCP reserve lands, that activities do not lead to the degradation of the habitat the reserves are designed to protect and do not result in harm or harassment of sensitive species. AMM37 provides specific guidance for recreation activities and facilities near habitat for sensitive species, such as active nest sites.

In absence of the implementation of AMM37, there would be a greater potential for significant impacts on biological resources due to loss and degradation of habitat, as well as the potential for the harm and harassment of special-status species. Refer to the impact analyses for each resource for more detail.

### 3B.4.38 AMM 38 California Black Rail

Preconstruction surveys for California black rail will be conducted where potentially suitable habitat for this species occurs within 500 feet of work areas where access is available. Potentially suitable habitat includes tidal and nontidal seasonal or perennial wetlands at least 2 acres in size with any kind of vegetation types consistent with black rail use in the Delta, as determined by field evaluations conducted by a qualified biologist with experience surveying for black rail, over 10 inches high, whether or not the patch in question was mapped as modeled habitat. Surveys will be initiated sometime between January 15 and February 1. A minimum of four surveys will be conducted. The survey dates will be spaced at least 2 to 3 weeks apart and will be scheduled so that the last survey is conducted no more than two weeks before April 15. This will allow the surveys to encompass the time period when the highest frequency of calls is likely to occur. These surveys will involve the following protocols (based on Evens et al. 1991), or other CDFW-approved survey methodologies that may be developed using new information and best-available science, and will be conducted by biologists with the qualifications stipulated in the CDFW-approved methodologies.

- Listening stations will be established at 300-foot intervals throughout potential black rail habitat that will be affected by covered activities. Listening stations will be placed along roads, trails, and levees to avoid trampling.
- California black rail vocalization recordings will be played at each station, and playing will cease immediately once a response is detected.
- Each listening station will be occupied for 6 minutes, including 1 minute of passive listening, 1 minute of “grr” calls followed by 30 seconds of “ki-ki-krrr” calls, then followed by another 3.5 minutes of passive listening.
- Each survey will include a survey at sunrise and a survey at sunset.
- Sunrise surveys will begin 60 minutes before sunrise and conclude 75 minutes after sunrise (or until presence is detected).
- Sunset surveys will begin 75 minutes before sunset and conclude 60 minutes after sunset (or until presence is detected).
- Surveys will not be conducted when tides are greater than National Geodetic Vertical Datum or when sloughs and marshes are more than bankfull.
- California black rail vocalizations will be recorded on a data sheet. A GPS receiver and compass will be used to identify surveys stations, angles to call locations, and call locations and distances. The call type, location, distance from listening station, and time will be recorded on a data sheet.

The project will be implemented in a manner that will not result in take of California black rail as defined by Section 86 of the California Fish and Game Code. If California black rail is present in the immediate construction area, the following measures will apply during construction activities.

- To avoid the loss of individual California black rails, activities within 500 feet of potential habitat will not occur within 2 hours before or after extreme high tides (6.5 feet or above, as measured at the Golden Gate Bridge). During high tide, protective cover for California black rail is sometimes limited, and activities could prevent them from reaching available cover.
- To avoid the loss of individual California black rails, activities within 500 feet of tidal marsh areas and managed wetlands will be avoided during the rail breeding season (February 1 – August 31), unless surveys are conducted to determine that no rails are present within the 500-foot buffer.
- If breeding California black rail is determined to be present, activities will not occur within 500 feet of an identified calling center (or a smaller distance if approved by CDFW). If the intervening distance between the rail calling center and any activity area is greater than 200 feet and across a major slough channel or substantial barrier (e.g., constructed noise barrier) it may proceed at that location within the breeding season.
- If California black rail are determined to be present in habitat that must be disturbed, vegetation will be removed during the nonbreeding season (September 1 – January 31) to encourage them to leave the area. Vegetation removal will be completed carefully using hand tools or vegetation removal equipment that is approved by a CDFW-approved biologist. The biologist will search vegetation immediately in front of the removal equipment, and will stop removal if rails are detected. Vegetation removal will resume when the rail leaves the area.
- If construction activities require removal of potential California black rail habitat, whether or not rails have been detected there, vegetation will be removed during the nonbreeding season

(September 1 – January 31). Vegetation removal will be completed carefully using hand tools or vegetation removal equipment that is approved by a CDFW-approved biologist. The biologist will search vegetation immediately in front of the removal equipment, and will stop removal if rails are detected. Vegetation removal will resume when the rail leaves the area.

- Exception: Inspection, maintenance, research, or nonconstruction monitoring activities may be performed during the California black rail breeding season (February 1 – August 31) in areas within or adjacent to breeding habitat (within 500 feet) with CDFW approval and under the supervision of permitted CDFW- approved biologist.
- If the construction footprint is within 500 feet of a known calling center, noise reduction structures such as temporary noise reducing walls, will be installed at the edge of construction footprint, as determined by an on-site CDFW-approved biologist. Noise-causing construction will begin during the nonbreeding season (September 1 – January 31) so that rails can acclimate to noise and activity prior to initiating nests.

**Explanation of effectiveness:** The proposed project would result in the loss or conversion of habitat for and effects on California black rail. The implementation of *AMM38 California Black Rail* would minimize the effects of construction on rails if present in or adjacent to the work area. Take, as defined under Section 86 of the California Fish and Game Code, of the species during construction would be avoided by establishing 500-foot no-disturbance buffers around identified territorial calling centers during the breeding season, as required by this AMM.

The preconstruction surveys, recommended work windows, and buffers would work to avoid and minimize disturbance of black rails, especially during the breeding season. These measures would help minimize the project's direct and indirect effects on individual black rails and the population within the Delta by avoiding and minimizing disruption of normal breeding behavior.

In absence of the implementation of AMM38, and AMM1–AMM7, and habitat restoration and protection measures, there would be a greater potential for significant impacts on this species due to loss of habitat and disruption of normal behaviors from construction and/or operation of the proposed project. Refer to the impact analyses for this species for more detail.

## 3B.4.39 AMM 39 White Tailed Kite

### 3B.4.39.1 Preconstruction Surveys

Preconstruction surveys will be conducted to identify the presence of active nest sites of tree nesting raptors within 0.25 mile of project sites, staging and storage areas, construction access roads, work areas, and soil stockpile areas where accessible, by a qualified biologist with experience identifying white-tailed kite nests. Transportation routes along public roads (roads leading to and from work areas) are considered disturbed, and no surveys or monitoring are required for nests along those roadways unless they are within ¼ mile of work areas. Surveys for nesting white-tailed kites will be conducted within 30 days prior to construction to ensure nesting activity is documented prior to the onset of construction activity during the nesting season. White-tailed kites nest in the Plan Area between approximately March 15 and September 15. While many nest sites are traditionally used for multiple years, new nest sites can be established in any year. Therefore, construction activity that is planned after March 15 of any year will require surveys during the year of the construction. If construction is planned before March 15 of any year, surveys will be conducted the year immediately prior to the year of construction. If construction is planned before March 15 of any year

and subject to prior-year surveys, but is later postponed to after March 15, surveys will also be conducted during the year of construction.

Construction will be restricted to the greatest extent possible during the nesting season where nest sites occur within 0.25 miles of construction activities, unless an already existing suitable buffer between the construction activity and the nest site is identified by a CDFW-approved biologist. Surveys for white-tailed kite nests and nesting activity will follow a protocol approved by CDFW. If active nests are found or nesting activity is identified within 0.25 miles of construction activities appropriate avoidance and minimization measures will be implemented as described below and in consultation with CDFW. Results of the surveys will be documented and submitted to CDFW no more than 5 days prior to beginning project activities.

Removal of known nest trees will be avoided to the maximum extent feasible. In the event that a known nest tree needs to be removed for project related activities, CDFW will be notified in writing of the location of the known nest tree and timing of removal. No trees with occupied nests will be removed until the nest is vacated. The tree replacement protocol described below will be followed to offset affected nest sites, or may be modified with written authorization from CDFW.

The CDFW-approved biologist will conduct a second survey of potential nesting trees and active nests, and monitor white-tailed kite nests no more than 72 hours prior to construction. If no nesting activity is found, then construction can proceed with no restrictions.

Where construction activities within 0.25 miles of an active nest cannot feasibly be avoided, construction will be initiated prior to egg-laying to the extent possible. If eggs and or young are present in the nest, work will be restricted until a CDFW-approved biologist determines that white-tailed kites have acclimated to disturbance and exhibit normal nesting behavior.

A 650-foot-radius nondisturbance buffer will be established around each active white-tailed kite nest site. No construction activity will be allowed to occur in the buffer while a nest site is occupied by white-tailed kite during the breeding season. The buffer size may be modified based on the field examination and determination by the CDFW-approved biologist of conditions that may minimize disturbance effects, including line-of-sight, topography, land use, type of disturbance, existing ambient noise and disturbance levels, and other relevant factors, as authorized by CDFW. The buffer will be clearly delineated with fencing or other conspicuous marking. Active nests will be monitored to track progress of nesting activities. Entry into the buffer will be granted when the CDFW-approved biologist determines that the young have fledged and are capable of independent survival or the nest has failed and the nest site is no longer active.

Where it is infeasible to avoid construction within 0.25 mile of an active white-tailed kite nest identified in preconstruction surveys, at a minimum the following measures will be implemented as part of a nesting bird monitoring and management plan that will be approved by CDFW. The final plan may include additional measures that are specific to site conditions.

- Five days and three days prior to the initiation of construction at any site where a nest is within 650 feet of construction, the designated Biological Monitor will observe the subject nest(s) for at least 1 hour and until normal nesting behavior can be determined. Nest status will be determined and normal nesting behaviors observed, which may be used to compare to the nesting activities once construction begins. The results of preconstruction monitoring will be reported to CDFW within 24 hours of each survey.

- Where pre-project surveys have identified an occupied white-tailed kite nest less than 325 feet from construction, the Biological Monitor will observe the nest periodically throughout the day where covered activities occur to ensure the white-tailed kites demonstrate normal nesting behavior.
- Where pre-project surveys have identified an occupied white-tailed kite nest between 325 to 650 feet from construction, the Biological Monitor will observe the nest for at least 2 hours per construction day where covered activities occur to ensure the white-tailed kites demonstrate normal nesting behavior.
- Where pre-project surveys have identified an occupied white-tailed kite nest between 650 to 1,300 feet from construction, the Biological Monitor will observe the nest for at least 3 days per construction week to ensure the white-tailed kites demonstrate normal nesting behavior and to check the status of the nest.

During construction or ongoing operation and maintenance activities, physical contact with an active nest tree is prohibited from the time of egg laying to fledging, unless approved by CDFW. Construction personnel outside of vehicles must remain at least 650 feet, or the length of a buffer approved by CDFW, from the nest tree unless construction activities require them to be closer.

All personnel will remain out of the line of sight of an occupied white-tailed kite nest during breaks if within 650 feet of the nest (as stated above, activities will only occur within 650 feet of a nest with written approval by CDFW).

The project will be implemented in a manner that will not result in take of white-tailed kite as defined by Section 86 of the California Fish and Game Code. If during construction monitoring, the designated biologist determines that a nesting white-tailed kite within 650 feet of construction is disturbed by construction activities, to the point where reproductive failure could occur, the designated biologist will immediately notify the Construction Supervisor and Program Environmental Manager. The Program Environmental Manager will contact CDFW, and it will be determined by the parties whether additional protection measures can be implemented. Potential nest abandonment and failure may be indicated if white-tailed kite exhibits distress and/or abnormal nesting behavior such as swooping/stooping at construction equipment or personnel, excessive vocalization [distress calls] or agitation directed at construction equipment or personnel, failure to remain on nest or failure to deliver prey items for an extended time period. Additional protection measures will remain in place until the white-tailed kite behavior has normalized.

### **3B.4.39.2 Nesting Habitat Replacement**

The following measures will be implemented to minimize near-term effects on the white-tailed kite populations that could otherwise result from loss of nesting habitat during the first 10 years of the permit term, before most of the restored riparian natural community has matured. Nesting habitat is limited throughout much of the Plan Area, consisting mainly of intermittent riparian, isolated trees, small groves, tree rows along field borders, roadside trees, and ornamental trees near rural residences. Removal of nest trees and nesting habitat could further reduce this limited resource and reduce or restrict the number of active white-tailed kites within the Plan Area until restored riparian habitat is sufficiently developed. To account for this potential near-term loss of nesting habitat, the following additional measures will be implemented.

### 3B.4.39.3 Tree Replacement with Saplings

Planting trees as potential nesting habitat for white-tailed kite is addressed in *CM7 Riparian Natural Community Restoration* and *CM11 Natural Communities Enhancement and Management*. While those measures address the overall long-term restoration of nesting habitat and the enhancement of conservation lands for these species, the following measures specifically address the removal of nest trees or nesting habitat during construction and provide a mechanism to compensate for this loss in order to minimize the near-term effects on white-tailed kite populations.

- a) Five trees (5-gallon-container size) will be planted on conservation lands for every known and potential white-tailed kite nest tree (20 feet or taller) removed by construction. Of the replacement trees planted, a variety of native tree species will be planted to provide trees with differing growth rates, maturation, and life span.
- b) Replacement trees will be planted with the mature trees to recreate nest sites, within the conservation lands in areas that support high-value white-tailed kite foraging habitat to increase nest sites or within the riparian plantings as a component of the requirement for riparian restoration where they are in close proximity to suitable foraging habitat. Replacement trees that are incorporated into the riparian restoration will not be clustered in a single region of the Plan Area, but will be distributed throughout the lands protected as foraging habitat for white-tailed kite.

The survival success of the planted trees described in (a) and (b) above will be monitored annually for a period of 10 years to assure survival and appropriate growth and development. Success will be measured as an 80% survival rate at 5 and 10 years after planting. Plantings will subsequently be monitored every 5 years to verify their continued survival and growth. For every tree lost during the 10-year time period, a replacement tree will be planted immediately upon the detection of failure. All necessary planting requirements and maintenance (i.e., fertilizing, irrigation) to ensure success will be provided. Trees will be irrigated for a minimum of the first 5 years after planting, and then gradually weaned off the irrigation during a period of approximately 2 years. If larger stock is planted, the number of years of irrigation will be increased accordingly. If the 80% establishment success cannot be met, protection of three mature nest trees can substitute for each failed nest tree attempt.

### 3B.4.39.4 Tree Replacement with Mature Trees

To further and more directly minimize the effects of near-term loss of nesting habitat for white-tailed kite, a program to plant mature trees will be implemented. Planting larger, mature trees, including transplanting trees scheduled for removal, and supplemented with additional saplings, is expected to accelerate the development of potential replacement nesting habitat.

- a) To compensate for the temporal loss of available white-tailed kite nest sites (defined as a 125-acre area where more than 50% of suitable nest trees (20 feet or taller) within the 125-acre block are removed), five mature native trees (at least 20 feet in height) will be transplanted at an appropriate location. Mature trees can be replaced with either nursery trees or trees scheduled to be removed by construction. To determine the number of replacement trees required, a grid of 125-acre blocks will be placed over each component of project footprint in which trees are to be removed, and the grid will be fixed in a manner that places the most complete squares of the grid in the project footprint (i.e., the grid will be adjusted so that, to the



extent possible, entire squares rather than portions of squares will overlap with the project footprint).

- a) The mature trees will be transplanted at a location that otherwise supports suitable habitat conditions for white-tailed kite. This could be around project facilities (while taking into consideration potential effects of noise and visual disturbance from facility operation), on new conservation lands, other existing conservation lands, or excess DWR land, as long as DWR controls the property. These trees will be transplanted as close as biologically feasible to the affected nest site (e.g. near the newly constructed intake facilities), unless such location would have low long-term conservation value due to factors such as threat of seasonal flooding or sea level rise, in which case the trees may be planted elsewhere on conservation lands.
- b) DWR may substitute transplanting of mature nest trees with protection of three suitable nest trees for each mature nest tree that would be transplanted.
- c) Replacement nest sites must be ½ mile or more apart and must be at least ½ mile from active nest trees.
- d) As with the sapling trees, the mature replacement trees will be monitored and maintained for 10 years to ensure survival and appropriate growth and development. Success will be measured using an 80% survival rate at 5 and 10 years after planting. In addition, 15 (5-gallon-container size) trees will be planted at each mature tree replacement site to provide longevity to the nest site. These 15 trees may be part of the trees committed to the project by item (a) included above as long they meet the survival criteria described in item (d) of Section 3B.4.39.3, *Tree Replacement with Saplings*.
- e) To reduce temporal impacts resulting from the loss of mature nest trees, the plantings described above will occur prior to or concurrent with the loss of trees.

**Explanation of effectiveness:** In the absence of other conservation actions, the effects on white-tailed kite habitat from the proposed project would represent an adverse effect as a result of habitat modification and potential for direct mortality of a special status species. Considering the proposed project's protection and restoration provisions and with implementation of AMM1–AMM7, AMM10, and AMM39 *White-Tailed Kite*, these effects would be less than significant and not result in take of white-tailed kite as defined in Section 86 of the California Fish and Game Code.

In absence of the implementation of AMM39, AMM1–AMM7, and AMM10, there would be a greater potential for significant impacts on this species due to loss of habitat and effects on the species from construction and/or operation of the proposed project. Refer to the impact analyses for the species for more detail.

## 3B.5 Conservation Measures

The measures discussed in this section would be implemented under any action alternative. The measures are called conservation measures under the BDCP alternatives, and Environmental Commitments under the non-HCP alternatives. The numbers and names of individual measures are the same under all action alternatives. For discussion of all conservation measures under BDCP alternatives, see BDCP Chapter 3, *Conservation Strategy*, Section 3.4.

### 3B.5.1 CM3 Natural Communities Protection and Restoration

**Explanation of effectiveness:** *CM3 Natural Communities Protection and Restoration* (Environmental Commitment 3 under Alternatives 4A, 2D, and 5A) would result in the protection and enhancement of natural communities and species habitats, including tidal, nontidal, and managed wetlands, vernal pool complex, alkali seasonal wetland complex, valley foothill riparian and grassland natural communities, and cultivated lands, which would help in offsetting impacts on recreation and terrestrial biological resources. Natural communities in the study area have been lost, fragmented, and degraded primarily as a result of agricultural conversion, flood control, and urban development. The protection and restoration of natural communities would eliminate future loss, fragmentation, and degradation within conservation lands, and natural communities restoration would reverse past loss, fragmentation, and degradation. The protection of cultivated lands under CM3 would allow for opportunities to maintain a mosaic of crop types on conservation lands and would enable the periodic rotation of essential crop types that provide foraging, roosting, and dispersal habitat for wildlife species such as Swanson's hawk, giant garter snake, and greater sandhill crane. CM3 would also prioritize the acquisition and protection of cultivated lands that expand upon or provide connectivity between existing conservation lands to benefit wildlife species. In the absence of the implementation of this conservation measure, other CMs, and AMMs, there would be a greater potential for significant impacts on these natural communities and associated species and their habitat due to loss of habitat from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail. For a thorough description of this measure, see EIR/EIS Chapter 3, *Description of Alternatives*, Section 3.6.2.1, and BDCP Chapter 3, *Conservation Strategy*, Section 3.4.3.

### 3B.5.2 CM4 Tidal Natural Communities Restoration:

**Explanation of effectiveness:** *CM4 Tidal Natural Communities Restoration* (Environmental Commitment 4 under Alternatives 2D, 4A, and 5A) would result in the restoration of tidal communities, which would help offset impacts on aquatic and terrestrial biological resources. For a thorough description of this measure, see EIR/EIS Chapter 3, *Description of Alternatives*, Section 3.6.2.1, and BDCP Chapter 3, *Conservation Strategy*, Section 3.4.4.

The proposed project would result in the near-term loss or conversion of tidal natural communities, including tidal perennial aquatic natural community, tidal freshwater emergent natural community, tidal brackish natural community, due to construction of the water conveyance facilities and restoration activities. These losses and conversions would be offset by planned restoration of high-value tidal perennial aquatic natural community scheduled for the first 10 years of the proposed project's implementation (CM4).

The operation and maintenance activities associated with the proposed project would have the potential to create minor losses in total acreage of tidal natural communities in the study area, and could create temporary increases in turbidity and sedimentation. The activities could also introduce herbicides periodically to control nonnative, invasive plants. Long-term restoration activities associated with *CM4 Tidal Natural Communities Restoration* would greatly expand this natural community in the study area. Ongoing operation, maintenance, and management activities would not result in a net permanent reduction in the acreage or value of this sensitive natural community within the study area.

The permanent and temporary loss of potential jurisdictional wetlands as a result of constructing project-related water conveyance facilities would be substantial if not compensated for by wetland protection and/or restoration. This loss would represent either temporary or permanent removal of federally protected wetlands or other waters of the United States as defined by Section 404 of the CWA. However, CM4 would restore and protect large acreages of tidal wetlands and open water. Impacts on wetlands from project construction would occur in the first 10 years after approval of the proposed project. Wetland restoration would occur during this time period, thereby offsetting the impacts of construction. Therefore, there would be a beneficial impact on potential jurisdictional wetlands and waters of the United States resulting from project implementation.

Tidal natural communities restoration under CM4 would increase and improve rearing habitat for fish species and increase the extent of habitat available for colonization by Mason's lilaeopsis, Suisun Marsh aster, delta mudwort, and Delta tule pea. Implementation of CM4 would help offset any loss or conversion of habitat for wildlife species such as salt marsh harvest mouse, tricolored blackbird, California black rail, and Suisun song sparrow.

In the absence of implementation of this conservation measure, other CMs, and AMMs, there would be a greater potential for significant impacts on these species and natural communities due to loss of habitat and loss of species from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### 3B.5.3 CM6 Channel Margin Enhancement

**Explanation of effectiveness:** CM6 Channel Margin Enhancement (Environmental Commitment 6 under Alternatives 4A, 2D, and 5A) would primarily help in offsetting impacts on aquatic biological resources. Some channel margin enhancement may also contribute to offsetting impacts on terrestrial species by providing early-successional riparian habitat for species such as Modesto song sparrow and other wildlife. For a thorough description of this measure, see EIR/EIS Chapter 3, *Description of Alternatives*, Section 3.6.2.1, and BDCP Chapter 3, *Conservation Strategy*, Section 3.4.6.

### 3B.5.4 CM7 Riparian Natural Community Restoration

**Explanation of effectiveness:** CM7 Riparian Natural Community Restoration (Environmental Commitment 7 under Alternatives 4A, 2D, and 5A) would result in the protection and restoration of riparian habitat, including specific riparian habitats for wildlife species, which would help in offsetting impacts on the valley foothill riparian natural community and on terrestrial wildlife species. For a thorough description of this measure, see EIR/EIS Chapter 3, *Description of Alternatives*, Section 3.6.2.1, and BDCP Chapter 3, *Conservation Strategy*, Section 3.4.7.

The proposed project would result in the loss or conversion of valley/foothill riparian natural community due to construction of the water conveyance facilities habitat restoration activities. The construction losses would be spread across the near-term timeframe. These losses would be minimized by planned restoration valley/foothill riparian natural community scheduled for the first 10 years of project implementation under CM7. The operation and maintenance activities associated with the proposed project would have the potential to create minor changes in total acreage of valley/foothill riparian natural community in the study area, and could create temporary increases in turbidity and sedimentation. The activities could also introduce herbicides periodically to control nonnative, invasive plants.

Long-term restoration and protection activities associated with *CM7 Riparian Natural Community Restoration* would improve the patch size and connectivity of this natural community in the study area. Riparian forest and scrub would be restored and protected to provide the range of conditions necessary to support habitat for riparian-associated wildlife species. Riparian areas would be restored, maintained, and enhanced to provide a mix of early-, mid-, and late-successional habitat types with a well-developed understory of dense shrubs. A single contiguous patch of 100 acres of mature riparian forest would be maintained which would serve to offset the loss of habitat for western yellow-billed cuckoo. Early- to mid- successional riparian vegetation would be maintained within the range of the riparian brush rabbit and the riparian woodrat and would include large patches of dense brush and upland refugia for the species. Riparian restoration and protection under CM7 would also be sited within drainages immediately adjacent to or in the vicinity of sites confirmed to be occupied by valley elderberry longhorn beetle, which would contribute to offsetting the loss of habitat for the beetle.

Riparian restoration and protection under CM7 would also offset the loss of nesting habitat for Swainson's hawk, white-tailed kite, and other nesting raptors and songbirds. It would also provide nesting habitat for cormorants, herons, and egrets, and roosting and foraging habitat for bat species.

In absence of the implementation of CM7, other CMs, and AMMs, there would be a greater potential for significant impacts on this natural community due to loss or degradation of riparian vegetation and loss of habitat for wildlife species from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### 3B.5.5 CM8 Grassland Natural Community Restoration

**Explanation of effectiveness:** *CM8 Grassland Natural Community Restoration* (Environmental Commitment 8 under Alternatives 4A, 2D, and 5A) would result in the restoration of grassland natural community. For a thorough description of this measure, see EIR/EIS Chapter 3, *Description of Alternatives*, Section 3.6.2.1, and BDCP Chapter 3, *Conservation Strategy*, Section 3.4.8.

The proposed project would result in the loss or conversion of grassland natural community from the construction of the water conveyance facilities and the implementation of conservation activities. The activities could also introduce herbicides periodically to control nonnative, invasive plants. Although the grassland natural community is not a special-status natural community, it provides nesting and foraging habitat for terrestrial wildlife species. Restoration activities associated with *CM8 Grassland Natural Community Restoration* would contribute to offsetting the loss of grassland habitat for wildlife species and increase the value of this natural community for these species in the study area.

The implementation of CM8 would connect fragmented patches of protected grassland and provide upland habitat adjacent to riparian and tidal natural communities for wildlife foraging and upland refugia. Under CM8 and CM3, grassland would be restored or protected on the landward side of levees adjacent to restored floodplain to provide flood refugia and foraging habitat for riparian brush rabbit, adjacent to nontidal perennial aquatic habitat to create upland habitat for giant garter snake, and adjacent to tidal marsh habitat to provide upland flood refugia for salt marsh harvest mouse and other native wildlife.

Under CM8, grasslands would be restored to sustain critical habitat functions such as foraging, dispersal, and shelter for other native species. Grassland restoration would increase the connectivity and quality of grassland habitat available for use by plant and wildlife species and, thus, contribute

to offsetting impacts on species habitat from the proposed project and contribute to their conservation. Other terrestrial species expected to benefit from restored grasslands include San Joaquin kit fox, American badger, tricolored blackbird, western burrowing owl, greater sandhill crane, Swainson's hawk, white-tailed kite, western pond turtle, California red-legged frog, California tiger salamander, heartscale, brittlescale, San Joaquin spearscale, and Carquinez goldenbush. Grassland restoration would also offset the loss of nesting habitat for grasshopper sparrow and California horned lark and the loss of foraging habitat for golden eagle.

In absence of the implementation of this conservation measure, other CMs and AMMs, there would be a greater potential for significant impacts on the species that utilize the grassland natural community due to loss of nesting, foraging, and refugia habitat from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### 3B.5.6 CM9 Vernal Pool and Alkali Seasonal Wetland Complex Restoration

***Explanation of effectiveness:*** *CM9 Vernal Pool and Alkali Seasonal Wetland Complex Restoration* (Environmental Commitment 9 under Alternatives 4A, 2D, and 5A) would result in the restoration of alkali season wetland complex and vernal pool complex natural communities, vernal pool crustacean and vernal pool invertebrate habitat, and habitat for common wildlife and plants. For a thorough description of this measure, see EIR/EIS Chapter 3, *Description of Alternatives*, Section 3.6.2.1, and BDCP Chapter 3, *Conservation Strategy*, Section 3.4.9.

The proposed project would result in the loss or degradation of alkali seasonal wetland complex and vernal pool complex natural communities from direct or indirect impacts of construction of the water conveyance facilities and conservation activities. Loss of vernal pool complex natural community would be considered both a loss in acreage of a sensitive natural community and a loss of wetland as defined by Section 404 of the CWA.

Under *CM9 Vernal Pool and Alkali Seasonal Wetland Complex Restoration*, vernal pool complex and alkali seasonal wetland complex would be restored to achieve no net loss of vernal pool and alkali seasonal wetland acreage from project activities. The restored vernal pool complex would consist of vernal pools and swales within a larger matrix of grasslands. Similarly, the alkali seasonal wetland complex would consist of alkali seasonal wetlands within a larger matrix of grasslands. The restored complexes would include sufficient watershed surrounding the restored vernal pools to sustain the hydrology characteristic of this natural community, at a density representative of intact vernal pool complexes in the vicinity of the restoration site. In lieu of restoration, an equivalent amount of vernal pool restoration credit may be purchased at a USFWS- and CDFW-approved mitigation bank if the bank occurs in the Plan Area and meets the site selection described in BDCP Chapter 3, *Conservation Strategy*, Section 3.4.9.3.2. The restoration activities under CM9 would offset the loss of vernal pool and alkali seasonal wetland complexes resulting from project activities.

The proposed project would also result in permanent losses and indirect conversions of habitat for vernal pool crustaceans, nonlisted vernal pool invertebrates, Heckard's pepper grass, and other native plant and wildlife species. The commitment to achieve no net loss of vernal pool and alkali seasonal wetland acreage and to maintain no net loss of Heckard's peppergrass within restoration sites or within the area of affected tidal range of restoration projects would benefit these species and contribute to offsetting any habitat loss or conversion as a result of the proposed project.

In absence of the implementation of this conservation measure, other CMs, and AMMs, there would be a greater potential for significant impacts on vernal pool complex and alkali seasonal wetland complex and the species that utilize the natural communities due to loss of habitat and loss of species from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### 3B.5.7 CM10 Nontidal Marsh Restoration

***Explanation of effectiveness:*** CM10 Nontidal Marsh Restoration (Environmental Commitment 10 under Alternatives 4A, 2D, and 5A) would result in the protection or restoration of aquatic natural communities, wetland natural communities which would help in offsetting impacts on nontidal wetlands and on terrestrial wildlife species. For a thorough description of this measure, see EIR/EIS Chapter 3, *Description of Alternatives*, Section 3.6.2.1, and BDCP Chapter 3, *Conservation Strategy*, Section 3.4.10.

The proposed project would result in the loss or conversion of nontidal wetlands consisting of nontidal perennial aquatic natural community, nontidal freshwater perennial emergent wetland, and managed wetland. Loss or conversion of these natural communities would result from the construction of the water conveyance facilities and the implementation of restoration activities. The permanent and temporary loss of potential jurisdictional wetlands as a result of the proposed project would be substantial if not compensated for by wetland protection and/or restoration. This loss would represent either temporary or permanent removal of federally protected wetlands or other waters of the United States as defined by Section 404 of the CWA. However, the implementation of CM10 would restore and protect large acreages of nontidal wetlands, which would offset the impacts of the proposed project on nontidal wetlands.

Construction and operation of the water conveyance facilities and habitat restoration activities would have impacts on native wildlife species including giant garter snake, tricolored blackbird, California black rail, western pond turtle, and greater sandhill crane through habitat loss and through direct or indirect loss or injury of individuals. The impacts related to losses in acreage and value of these habitats would be offset by AMMs, in addition to the protection, restoration, enhancement, and management actions contained in the proposed project, including CM10 Nontidal Marsh Restoration. The primary purpose of CM10 is to restore nontidal freshwater emergent wetland and nontidal perennial aquatic natural communities to create additional foraging and breeding habitat for giant garter snake, greater sandhill crane, western pond turtle, and other native wildlife and plant species characteristic of these natural communities. Restored nontidal marsh would be designed and managed primarily to support giant garter snake, but also to support other native wildlife functions, including waterfowl foraging, resting, and brood habitat, and shorebird foraging and roosting habitat, to the extent that management for these species does not reduce habitat value for the giant garter snake. The creation of greater sandhill crane roosting habitat would offset adverse effects on roosting habitat resulting from project activities, and would further contribute to the conservation of this species by protecting suitable roosting habitat from being converted to unsuitable cover types such as orchards and vineyards.

In absence of the implementation of this conservation measure, other CMs, and AMMs, there would be a greater potential for significant impacts on this natural community and loss of habitat for wildlife species from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### 3B.5.8 CM11 Natural Communities Enhancement and Management

**Explanation of effectiveness:** *CM11 Natural Communities Enhancement and Management* (Environmental Commitment 11 under Alternatives 4A, 2D, and 5A) would result in the enhancement and management of aquatic and terrestrial natural communities and species habitats, including tidal, nontidal, and managed wetlands, vernal pool complex, alkali seasonal wetland complex, valley foothill riparian and grassland natural communities, and cultivated lands, which would help in offsetting impacts on terrestrial biological resources. Natural communities that are protected or restored would be enhanced for the purposes of increasing native biodiversity and improving habitat quality for native plant and wildlife species. Natural communities would be managed for the purposes of maintaining native biodiversity and habitat quality, and for sustaining populations of native species on conservation lands in the study area. Refer to the impact analyses for each resource for more detail. For a thorough description of this measure, and specific management actions for each natural community see EIR/EIS Chapter 3, *Description of Alternatives*, Section 3.6.2.1, and BDCP Chapter 3, *Conservation Strategy*, Section 3.4.11.

In absence of the implementation of this conservation measure, other CMs, and AMMs, there would be a greater potential for significant impacts on plant and wildlife species and natural communities due to loss of habitat and loss of species from construction and/or operation of the proposed project. Refer to the impact analyses for each resource for more detail.

### 3B.5.9 CM12 Methylmercury Management

**Explanation of effectiveness:** *CM12 Methylmercury Management* (Environmental Commitment 12 under Alternatives 4A, 2D, and 5A) addresses the potential for methylmercury bioaccumulation associated with restoration activities and acknowledges the uncertainties associated with mitigating or minimizing this potential effect. For a thorough description of this measure, see EIR/EIS Chapter 3, *Description of Alternatives*, Section 3.6.2.2, and BDCP Chapter 3, *Conservation Strategy*, Section 3.4.12.

CM12 proposes project-specific mercury management plans for restoration actions that will incorporate relevant approaches recommended in Phase 1 Methylmercury TMDL control studies. Specific approaches recommended under CM12 that are intended to minimize or mitigate for potential increases in methylmercury bioaccumulation at future restoration sites include:

- Characterizing mercury, methylmercury, organic carbon, iron, and sulfate concentrations to better inform restoration design,
- Sequestering methylmercury at restoration sites using low intensity chemical dosing techniques,
- Minimizing microbial methylation associated with anoxic conditions by reducing the amount of organic material at a restoration site (this approach could limit the benefit of restoration areas by limiting the amount of carbon supplied by these areas to the Delta as a whole. In some cases, this would run directly counter to the goals and objectives of the BDCP. This approach should not be implemented in such a way that it reduces the benefits to the Delta ecosystem provided by restoration areas),

- Designing restoration sites to enhance photo degeneration that converts methylmercury into a biologically unavailable, inorganic form of mercury,
- Remediating restoration site soils with iron to reduce methylation in sulfide rich soils, and
- Considering capping mercury laden sediments, where possible to reduce methylation potential at a site.

The implementation of CM12 would provide for site-specific assessments of restoration areas, integration of design measures to minimize methylmercury production, and site monitoring and reporting. As a result, effects of methylmercury mobilization on covered fish at the tidal wetland restoration sites are expected to be minimized and not adverse.

Construction and grading from the proposed project would have the potential to mobilize or substantially increase constituents known to bioaccumulate. Measures implemented as part of CM12 may include construction and grading in a way that minimizes exposure of mercury-containing soils to the water column; designing areas to support/enhance photodegradation; and pre-design field studies to identify depositional areas where mercury accumulation is most likely and characterization and/or design that avoids these areas. *CM12 Methylmercury Management* provides for consideration of new information related to methylmercury degradation that could effectively mitigate methylmercury production and mobilization. Furthermore, implementation of *CM12 Methylmercury Management*, would minimize effects because it provides for project-specific mercury management plans including a quality assurance/quality control program, and specific tidal habitat restoration design elements to reduce the potential for methylation of mercury and its bioavailability in tidal habitats. With implementation of CM12, adverse effects on public health due to the substantial mobilization of or increase in methylmercury are not expected to occur.

Water quality effects on mercury concentrations may result from implementation of conservation measures. The effectiveness of minimization and mitigation actions implemented according to the mercury management plans is not known at this time, although the potential to reduce methylmercury concentrations exists based on current research. Although CM12 would be implemented with the goal to reduce this potential effect, there remain uncertainties related to site-specific restoration conditions and the potential for increases in methylmercury concentrations in the Delta in the vicinity of the restored areas. Therefore, the effect of conservation measures on mercury and methylmercury would still be considered adverse.

CM12 addresses the potential for methylmercury bioaccumulation associated with restoration activities and acknowledges the uncertainties associated with mitigating or minimizing this potential effect. Because of the uncertainties associated with site-specific estimates of methylmercury concentrations and the uncertainties in source modeling and tissue modeling, the effectiveness of methylmercury management proposed under CM12 to reduce methylmercury concentrations would need to be evaluated separately for each restoration effort, as part of design and implementation. Because of this uncertainty and the known potential for methylmercury creation in the Delta, this potential effect of implementing restoration measures is considered adverse. Key uncertainties associated with CM12 include the effectiveness of the measure in minimizing production and mobilization of methylmercury from lands in the reserve system and the foodweb and whether actions under CM12 interfere with the potential of a restoration project to meet its intended purpose. Compliance monitoring will document completion and implementation of site-specific methylmercury management plans for restoration sites. Effectiveness monitoring



will assess how well CM12 minimizes production and mobilization of methylmercury from project activities into the aquatic system and the foodweb.

In absence of the implementation of this conservation measure, there would be a greater potential for significant impacts on water quality, fish, wildlife, and humans due to bioaccumulation and higher mercury concentrations. CM12 proposes project-specific mercury management plans for restoration actions that would minimize or mitigate potential increases in methylmercury bioaccumulation at future restoration sites. However, the effectiveness of this conservation measure is still uncertain, and it would not be sufficient to reduce all effects to a less-than-significant level.

### 3B.5.10 CM15 Localized Reduction of Predatory Fishes (Predator Control)

**Explanation of effectiveness:** CM15 (Environmental Commitment 15 under Alternatives 4A, 2D, and 5A) would reduce populations of predatory fishes at specific locations and eliminate or modify holding habitat for predators at selected locations of high predation risk (i.e., predation *hotspots*). This conservation measure seeks to benefit covered salmonids by reducing mortality rates of juvenile migratory life stages that are particularly vulnerable to predatory fishes. For a thorough description of this measure, see EIR/EIS Chapter 3, *Description of Alternatives*, Section 3.6.2.2, and BDCP Chapter 3, *Conservation Strategy*, Section 3.4.15.

A feasibility assessment study would be incorporated in this conservation measure to evaluate the effectiveness of modifying or eliminating habitat features that provide holding habitat for predatory fish and/or increase capture efficiency by predators (e.g., abandoned boats and derelict structures). Because of the high degree of uncertainty regarding predation/competition dynamics for covered fish species and the feasibility and effectiveness of safely removing large fractions of existing predator populations, the proposed predator reduction program is envisioned as an experimental feasibility assessment study within an adaptive management framework. The feasibility assessment study would be carefully monitored and refined to determine which practices are effective. If the feasibility assessment study shows that the main issues are resolvable, a defined predator reduction program may be implemented (i.e., defined in terms of predator reduction techniques and the sites and/or areas of the Plan Area where techniques will be employed). Research and monitoring would continue throughout the duration of the program to address remaining uncertainties and ensure the measures are effective (i.e., that they reduce local abundance of predators and increase survival of covered salmonids).

The progress of the hotspot feasibility assessment study and research activities would be documented annually in the Adaptive Management and Monitoring Report. During year 1, DWR would evaluate the strategies for logistical issues, relative effectiveness, incidental impacts on covered fish, and cost-effectiveness. After year 2 of feasibility assessment study implementation, DWR would refine the scope and methodology of the study—based on review and coordination with the resource agencies—and continue with implementation for an additional 4 to 6 years. Key uncertainties associated with this measure include determining where predation is likely to occur in vicinity of new north Delta intakes, determining the best predator reduction techniques, determining predator density and distribution in vicinity of the north Delta intakes, prioritizing hotspots for localized predator reduction, and assessing the effects of localized predator reduction measures on covered fish species.

In absence of the implementation of this conservation measure, there would likely be a greater potential for significant impacts to covered salmonids. However, the effectiveness of this conservation measure is still uncertain.

### 3B.5.11 CM16 Nonphysical Fish Barriers

**Explanation of effectiveness:** CM16 (Environmental Commitment 16 under Alternatives 4A, 2D, and 5A) would be implemented to improve the survival of outmigrating juvenile salmonids by using nonphysical barriers to redirect the fish away from channels and river reaches in which survival is lower than in alternate routes. For a thorough description of this measure, see EIR/EIS Chapter 3, *Description of Alternatives*, Section 3.6.2.2, and BDCP Chapter 3, *Conservation Strategy*, Section 3.4.16.

Nonphysical barriers would consist of technology appropriate for each site. These barriers may use a combination of sound, light, and bubbles similar to the BioAcoustic Fish Fences (BAFFs) tested at the head of Old River and at Georgiana Slough. In addition to these BAFF system evaluations of what may be considered true nonphysical barriers, studies are also underway to determine the effectiveness of a floating fish guidance structure. This structure uses steel panels suspended from floats to change water currents so that fish are guided towards the center of the river (away from other channel entrances), but does not substantially change the amount of water entering the channels. Potential sites for nonphysical barrier placement include Georgiana Slough, head of Old River, Delta Cross Channel, Turner Cut, and Columbia Cut (note that Turner and Columbia Cut each have two channels, and thus would require two barriers). Barriers at these locations have a high potential to deter juvenile salmonids from using specific channels/migration routes that may contribute to decreased survival resulting from increased predation and/or entrainment. Nonphysical fish barriers have not been shown to be effective for other covered fish species; thus, this conservation measure is only expected to yield beneficial outcomes for salmonids.

Implementation of this conservation measure by DWR would be informed through effectiveness monitoring. Monitoring would include studies to evaluate the effectiveness of nonphysical barriers using tagged juvenile salmonids. The studies would document the interaction of tagged fish with nonphysical barriers and the effectiveness of nonphysical barriers at directing fish toward preferred migration routes/channels and away from channels or migration routes that have higher mortality associated with either predation and/or entrainment.

Uncertainty regarding the potential attraction of predators to nonphysical barriers and the effectiveness of barriers under certain conditions (i.e., in high flow areas, areas with complex bathymetry or cover, or other areas that may have physical conditions that may limit their effectiveness) will be resolved as this conservation measure is implemented on an individual project level. Thus evaluating the potential attraction of predators and the effectiveness of nonphysical barriers under various conditions would also be part of the monitoring to be completed as part of this conservation measure.

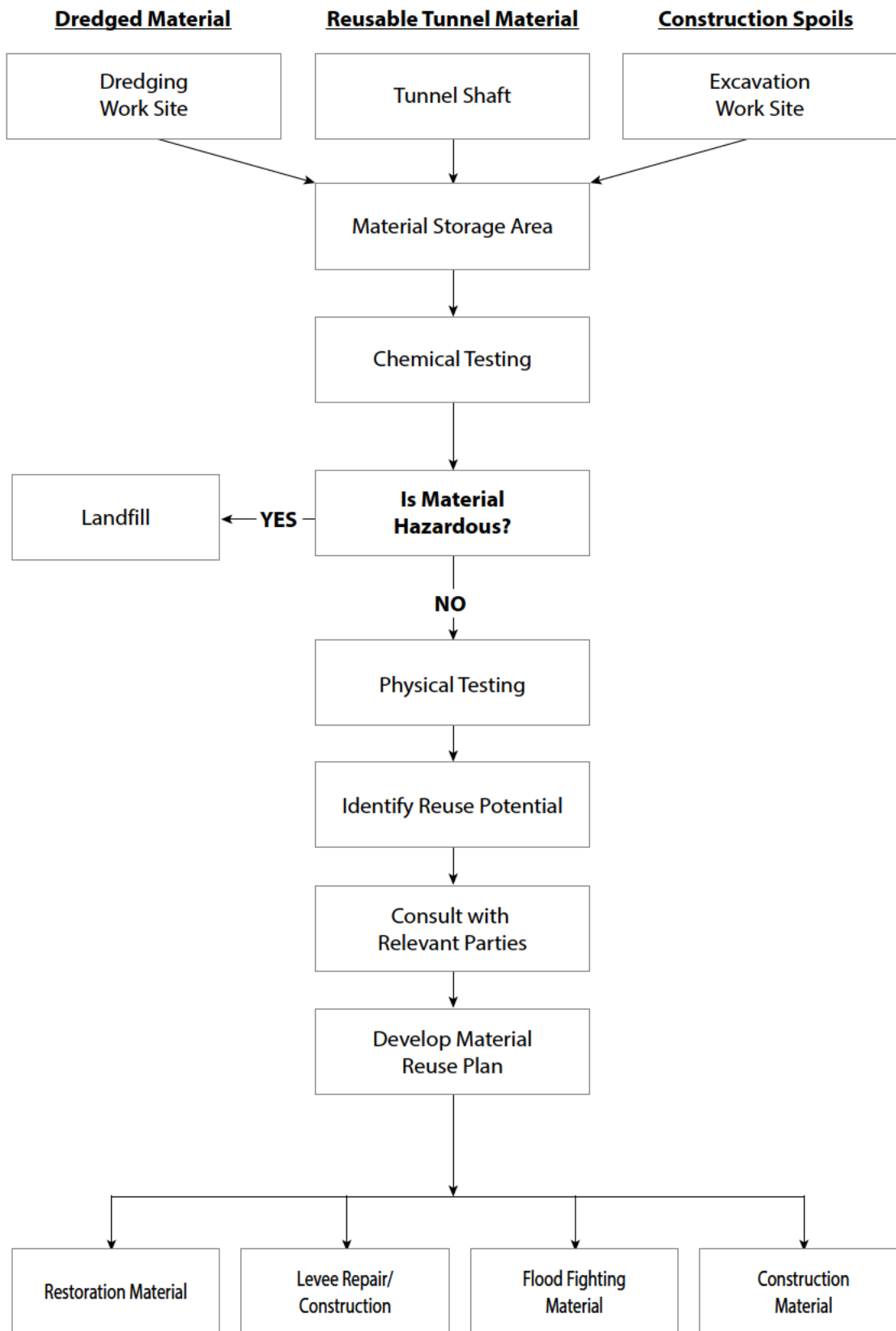
In absence of the implementation of this conservation measure, there would be a greater potential for significant impacts on outmigrating juvenile salmonids. Effectiveness would be site-specific, and as described above, have been shown to be successful at deterring juvenile salmonids from choosing routes that would otherwise lead to decreased survival from predation and/or entrainment. Because it is site-specific, the effectiveness of this conservation measure is still uncertain at all locations, but would be carefully monitored for areas of improvement.

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**Figure 3B-1**  
**Process for Disposal and Reuse**  
**of Material from Construction**