

CHAPTER 7.0 POTENTIAL EFFECTS, REGULATORY FRAMEWORK, AND BEST MANAGEMENT PRACTICES FOR INTERRELATED PCWA OPERATIONS AND MAINTENANCE ACTIVITIES

This chapter provides an overview of the potential effects of interrelated PCWA O&M activities on natural resource conditions in the study area, the regulatory framework for effects, and potential BMPs to reduce effects of interrelated PCWA O&M activities on natural resources.

7.1 POTENTIAL EFFECTS OF INTERRELATED PCWA OPERATIONS AND MAINTENANCE ACTIVITIES ON NATURAL RESOURCES

This section describes potential effects of PCWA O&M activities that, when combined, may increase adverse effects to natural resources. Interpretations of the potential effects of interrelated PCWA activities are based on the potential effects of operations activities discussed in **Chapter 5** and potential effects of PCWA maintenance activities discussed in **Chapter 6**. Potential interrelated effects associated with canal or pipe repair, however, are not addressed in this chapter. As described in **Chapter 6**, canal repair and pipe repair activities should require project-specific environmental resources analyses to assess the potential effects of the activity on natural resources, and an evaluation to determine measures to minimize potential negative effects.

7.1.1 Yearly Outages

PCWA operations during the PG&E yearly outages in combination with other PCWA O&M activities may increase adverse effects to natural resources. No interrelated effects are anticipated on natural resources during PCWA operations related to yearly outages and:

- Seasonal delivery schedule changes
- Seasonal flood management practices
- Maintenance related to physical removal of vegetation along PCWA's raw water distribution system
- Maintenance related to herbicide applications along PCWA's raw water distribution system

The following summarizes potential effects of PCWA operations during yearly outages that may be interrelated to potential effects observed during other PCWA O&M activities:

- Routine Operations – During routine PCWA operations, the PCWA canal system provides direct contributions to flows within study area streams through regulated releases to streams used for conveyance to customers, unregulated releases from canal

outlets, and indirect contributions through customer return flows (USACE and PCWA 2008). These canal system contributions to streamflow have a positive effect on hydrologic conditions in study area streams, creating and sustaining suitable habitat conditions for many aquatic species during the dry season. These positive effects on natural resources, when combined with potential negative effects on hydrological conditions associated with PCWA's operations during the outages, likely result in interrelated effects to natural resources. Potential interrelated effects to biological resources, including wetlands supported by canal contributions, Central Valley steelhead, and Chinook salmon, are representative of historic conditions within the study area.

- Canal Cleaning – Removal of debris and sediment from the canals during canal cleaning activities potentially reduces adverse interrelated effects of PCWA operations during yearly outages on water quality conditions in study area streams. PCWA's canal cleaning activities remove much of the unconsolidated sediment, organic material, and associated copper from algaecide applications that may settle in canals when canals are dewatered during the outage.
- Weed and Brush Control – Algaecide Application: Interrelated effects of PCWA operations during yearly outages and PCWA's algaecide applications were observed during water quality monitoring events for yearly outages, particularly within the Secret Ravine watershed. Measured copper values at canal and stream sites in the Secret Ravine watershed during the October 2007 sampling event increased after flows were restored to the canal system. The higher copper values observed during the yearly outages were likely attributed to mobilization of copper associated with fine sediment and organic material remaining within the canals after canal cleaning activities, or that had accumulated and settled when canals were dewatered during the outage. The affects on water quality from these interrelated activities likely result in adverse effects on terrestrial and aquatic biological resources.
- Canal lining – Removal of debris and sediment from the canals during canal preparation for lining activities, along with improved canal bank stability when canals are lined, likely decreases potential adverse effects of PCWA operations during PG&E yearly outages on water quality conditions in study area streams.

7.1.2 Seasonal Delivery Schedule Changes

No interrelated effects are anticipated on natural resources during PCWA operations related to seasonal delivery schedule changes in combination with other PCWA O&M activities.

7.1.3 Seasonal Flood Management Practices

PCWA operations during seasonal flood management practices in combination with other PCWA O&M activities may increase adverse effects to natural resources. No interrelated effects

are anticipated on natural resources during PCWA operations related to seasonal flood management practices and:

- Yearly outages
- Seasonal delivery schedule changes
- Routine operations
- Maintenance from physical removal of vegetation along PCWA's raw water distribution system
- Maintenance from herbicide applications along PCWA's raw water distribution system

The following summarizes potential effects of PCWA operations during seasonal flood management practices that may be interrelated to potential effects observed during other PCWA O&M activities:

- Canal Cleaning – Removal of debris and sediment from the canals during canal cleaning activities potentially reduces adverse interrelated effects of PCWA operations during seasonal flood management practices on water quality conditions in study area streams. PCWA's canal cleaning activities remove much of the unconsolidated sediment and organic material that accumulates in canals and may be flushed from canals during seasonal flood management practices. These effects are likely similar to conditions generally exhibited across study area streams during periods of high precipitation runoff.
- Weed and Brush Control – Algaecide Application – Flood management practices have the potential to cause adverse effects to natural resources when combined with algaecide applications along PCWA's raw water distribution system. Potential adverse effects may occur through loading of copper remaining within the canals after canal cleaning activities to wetlands and streams, and accumulation of copper in wetland and stream sediments may affect biological resources.
- Canal Lining – Within sections of the canal system that are lined or recently lined before PCWA seasonal flood management practices, canal lining activities potentially result in reduced adverse interrelated effects from PCWA operations during seasonal flood management practices. Removal of debris and sediment from the canals during canal preparation for lining activities, along with improved canal bank stability when canals are lined, potentially decreases adverse effects of PCWA operations during seasonal flood management practices on water quality conditions in study area streams, similar to conditions generally exhibited across study area streams during periods of high precipitation runoff.

7.1.4 Routine Operations

Routine PCWA operations in combination with other PCWA O&M activities may increase adverse effects to natural resources. No interrelated effects are anticipated on natural resources during PCWA operations related to routine operations and:

- Seasonal delivery schedule changes
- Seasonal flood management practices
- Routine operations
- Canal cleaning along PCWA's raw water distribution system
- Physical removal of vegetation along PCWA's raw water distribution system
- Herbicide applications along PCWA's raw water distribution system

The following summarizes potential effects of PCWA operations during routine operations that may be interrelated to potential effects observed during other PCWA O&M activities:

- Yearly Outages – When combined with operations during PG&E yearly outages, negative effects on hydrological conditions associated with PCWA's routine operations during the yearly outages may increase adverse effects to natural resources. These potential interrelated effects are summarized above in the section describing interrelated effects associated with PCWA operations during PG&E yearly outages. As described in **Chapter 5**, flow contributions associated with PCWA routine operations have an overall positive effect on hydrologic conditions in study area streams.
- Canal Lining – Removal of debris and sediment from the canals during canal preparation for lining activities, along with improved canal bank stability when canals are lined, likely decreases potential adverse effects of routine operations on water quality conditions in study area streams.

7.1.5 Canal Cleaning and Flushing

PCWA operations during canal cleaning in combination with other PCWA O&M activities may increase adverse effects to natural resources. No interrelated effects are anticipated on natural resources during PCWA operations related to canal cleaning and:

- Seasonal delivery schedule changes
- Routine operations
- Physical removal of vegetation along PCWA's raw water distribution system

- Herbicide applications along PCWA's raw water distribution system
- Canal lining along PCWA's raw water distribution system

The following summarizes potential effects of PCWA operations during canal cleaning that may be interrelated to potential effects observed during other PCWA O&M activities:

- Yearly Outages – As described above, removal of debris and sediment from the canals during canal cleaning activities likely decreases potential adverse effects of PCWA operations during yearly outages on water quality conditions in study area streams.
- Seasonal flood management practices – As described above, removal of debris and sediment from the canals during canal cleaning activities likely decreases potential adverse effects of PCWA operations during seasonal flood management practices on water quality conditions in study area streams.
- Weed and Brush Control – Algaecide Application – PCWA's canal cleaning activities, when combined with algaecide applications along PCWA's raw water distribution system, likely have adverse interrelated effects to natural resources. Water quality data collected during canal cleaning activities, summarized in **Chapter 6**, show increased concentrations of copper at study area stream sites immediately following canal cleaning. Increased concentrations of copper are likely the result of the mobilization of copper associated with fine sediment and organic material remaining within the canals after canal cleaning activities or that had settled within upstream and/or downstream canal sections that were dewatered for canal cleaning. Copper loading to wetlands and streams, and accumulation of copper in wetland and stream sediments may affect biological resources.

7.1.6 Weed and Brush Control – Physical Removal of Vegetation

No interrelated effects are anticipated on natural resources during physical removal of vegetation in combination with other PCWA O&M activities.

7.1.7 Weed and Brush Control – Algaecide Application

Algaecide applications along PCWA's raw water distribution system in combination with other PCWA O&M activities may increase adverse effects to natural resources. No interrelated effects are anticipated on natural resources during algaecide applications and:

- Seasonal delivery schedule changes
- Routine operations
- Physical removal of vegetation along the PCWA canal system

- Herbicide applications along PCWA's raw water distribution system

The following summarizes potential interrelated effects of PCWA algaecide applications when combined with other PCWA O&M activities:

- Yearly Outages – PCWA's algaecide applications, when combined with operations during yearly outages, will likely result in adverse interrelated effects to natural resources. As described above, higher copper concentrations observed at sites during yearly outage water quality monitoring events were likely attributed to mobilization of copper associated with fine sediment and organic material that had settled when canals were dewatered during the outage. Copper loading to wetlands and streams, and accumulation of copper in wetland and stream sediments may affect biological resources.
- Seasonal Flood Management Practices – Algaecide applications along PCWA's raw water distribution system have the potential to cause adverse effects to natural resources when combined with seasonal flood management practices. Potential adverse effects may occur through copper loading to wetlands and streams, and accumulation of copper in wetland and stream sediments may affect biological resources.
- Canal Cleaning – As described above, PCWA algaecide applications, when combined with canal cleaning activities, likely result in adverse interrelated effects to natural resources. Increased concentrations of copper in study area streams following canal cleaning activities are likely the result of the mobilization of copper from algaecide applications associated with fine sediment and organic material that had settled when canals were dewatered for canal cleaning. Accumulation of copper in wetland and stream sediments may affect biological resources.
- Canal Lining – Similar to potential interrelated effects associated with algaecide applications and canal cleaning activities, PCWA algaecide applications, when combined with canal lining activities, likely cause adverse interrelated affects to natural resources. Measured copper values in study area streams following canal lining activities were marginally higher compared to routine operations. The higher values result from the mobilization of copper from algaecide applications associated with fine sediment and organic material that had settled when canals were dewatered for canal lining.

7.1.8 Weed and Brush Control – Herbicide Application

No interrelated effects are anticipated on natural resources during PCWA herbicide applications in combination with other PCWA O&M activities.

7.1.9 Canal Lining

PCWA canal lining activities in combination with other PCWA O&M activities may increase adverse effects to natural resources. No interrelated effects are anticipated on natural resources during PCWA operations related to canal lining and:

- Yearly outages
- Seasonal schedule delivery changes
- Seasonal flood management practices
- Canal cleaning along PCWA's raw water distribution system
- The physical removal of vegetation along PCWA's raw water distribution system
- Herbicide applications along PCWA's raw water distribution system

The following summarizes potential effects of PCWA operations during canal lining that may be interrelated to potential effects observed during other PCWA O&M activities:

- Routine Operations – Similar to conditions for seasonal flood management practices and described above, removal of debris and sediment from the canals during canal preparation for lining activities, along with improved canal bank stability when canals are lined, likely decreases potential adverse effects of routine operations on water quality conditions in study area streams.
- Weed and Brush Control – Algaecide Application – As described above, canal lining activities, when combined algaecide applications, likely have adverse interrelated effects to natural resources. Higher concentrations of copper observed in study area streams following canal lining activities were likely due to the mobilization of copper from algaecide applications associated with fine sediment and organic material that had settled when canals were dewatered for canal lining. Accumulation of copper in wetland and stream sediments may affect biological resources.

7.2 REGULATORY FRAMEWORK FOR POTENTIAL EFFECTS OF INTERRELATED PCWA OPERATIONS AND MAINTENANCE ACTIVITIES

The regulatory framework for potential effects of PCWA operations activities described in **Chapter 5**, along with the regulatory framework for potential effects of PCWA maintenance activities described in **Chapter 6**, apply to the potential interrelated effects described in this chapter. The regulatory framework for each of the potential interrelated PCWA O&M activities described that may have adverse effects on natural resources when combined with other O&M activities is summarized in **Tables 5-3** and **6-11**. The following sections provide an overview of

the Federal and State regulations, and local requirements and considerations applicable to the potential effects of interrelated O&M activities described above.

7.2.1 Federal Regulations

Federal laws and regulations associated with the potential effects of interrelated PCWA O&M activities are described in **Chapters 5** and **6**, and listed below:

- CWA
- ESA
- Magnuson-Stevens Fishery Conservation and Management Act and the 1996 Sustainable Fisheries Act
- MBTA

7.2.2 State Regulations

Laws and regulations governed by the State of California and associated with the potential effects of interrelated PCWA O&M activities are described in **Chapters 5** and **6**, and listed below:

- CEQA
- Porter-Cologne Water Quality Control Act
- California ESA
- California Fish and Game Code-Fully Protected Species
- California Fish and Game Code Section 1602 – Lake and Streambed Alteration Program
- California Native Plant Protection Act

7.2.3 Local Requirements and Considerations

The following local requirements and considerations are associated with the potential effects of interrelated PCWA O&M activities are described in **Chapters 5** and **6**:

- PCCP
- Placer County SWMP
- Placer County Code, Tree Preservation Ordinance

- Placer County Oak Woodland Management Plan

7.3 BEST MANAGEMENT PRACTICE OPTIONS TO ADDRESS POTENTIAL EFFECTS OF INTERRELATED PCWA OPERATIONS AND MAINTENANCE ACTIVITIES

The BMPs to address potential effects of PCWA operations activities described in **Chapter 5**, along with the regulatory framework for potential effects of PCWA maintenance activities described in **Chapter 6**, also apply for the potential interrelated effects described in this chapter. Potential BMPs to reduce potential effects of interrelated PCWA O&M activities on natural resources are summarized in **Tables 5-3** and **6-11**, and listed below. The list of BMP options is not comprehensive; instead, it provides examples of BMPs that may be implemented to minimize particular potential effects of interrelated PCWA O&M activities.

7.3.1 Pre-Implementation Best Management Practices

Below are potential pre-implementation BMPs for reducing potential effects of interrelated PCWA O&M activities on natural resources in the study area.

- Improve canal bank stability and install sediment traps at canal outlets
 - Install velocity dissipaters at canal outlets
 - Line banks at canal outlets
 - Install erosion-control blankets in areas of soil disturbance
 - Install temporary fiber rolls in areas of soil disturbance
 - Apply spray-on soil binders in areas of soil disturbance
- Avoid potential wet weather effects
 - Patrol canals and remove potential obstructions to prevent erosion and property damage
 - Minimize amount of water purchased from PG&E during periods of high precipitation
 - Distribute flood releases from canal system by releasing flows at numerous intermediate outlets
 - Plan and design projects to minimize land disturbance
 - Install erosion and sedimentation control measures after land-disturbing activities
 - Identify areas susceptible to erosion for future canal lining activities
 - Choose canal crossing sites where erosion potential is low
- Protect sensitive species and sensitive species habitat

- Provide staff with species identification training
- Evaluate sites with sensitive species and mark/protect sensitive species habitat
- Stockpile materials away from sensitive species habitat areas
- Strategic scheduling of maintenance activities

7.3.2 Implementation Best Management Practices

The following sections are implementation BMPS to reduce potential effects of PCWA maintenance activities on natural resources:

- Avoid sensitive species areas
 - Avoid disturbance to sensitive species
 - Avoid active raptor nesting areas
- Prevent degraded water from entering streams after O&M activities
 - Modify canal operations to gradually restore reservoir releases to canals at slower rate
 - Apply sediment trap at storm drains for dewatering before canal lining
 - Treat first flush flows to reduce downstream water quality effects

7.3.3 Ongoing or Post-Implementation Best Management Practices

The following are ongoing post-implementation BMPs to reduce the potential interrelated effects of PCWA O&M activities on natural resources:

- Regulatory compliance management for O&M activities
- PCWA Best Management Practice Program
- Good housekeeping
 - Ensure proper handling of materials and wastes
 - Use proper cleanup procedures after material use
 - Implement onsite debris and trash management practices
 - Store materials under a roof or covering with a secure tarp