

Water Temperature and Dissolved Oxygen

Water temperature or DO levels observed at Clover Valley Creek downstream from canal lining activities were not affected by of canal lining along the Antelope Canal.

pH, Alkalinity, and Hardness

Measured pH values at ANTCR increased to up to 11.66 after flows were restored to Antelope Canal following canal lining. Alkalinity and hardness at the Antelope Canal Outlet release also increased for a short duration. Based on water quality measurements upstream (CLVRC6) and downstream (CLVRC3B) from the canal lining, pH, alkalinity, and hardness conditions in Clover Valley Creek did not appear to be affected by canal lining activities. These results are shown below in **Figures 6-17 to 6-19**.

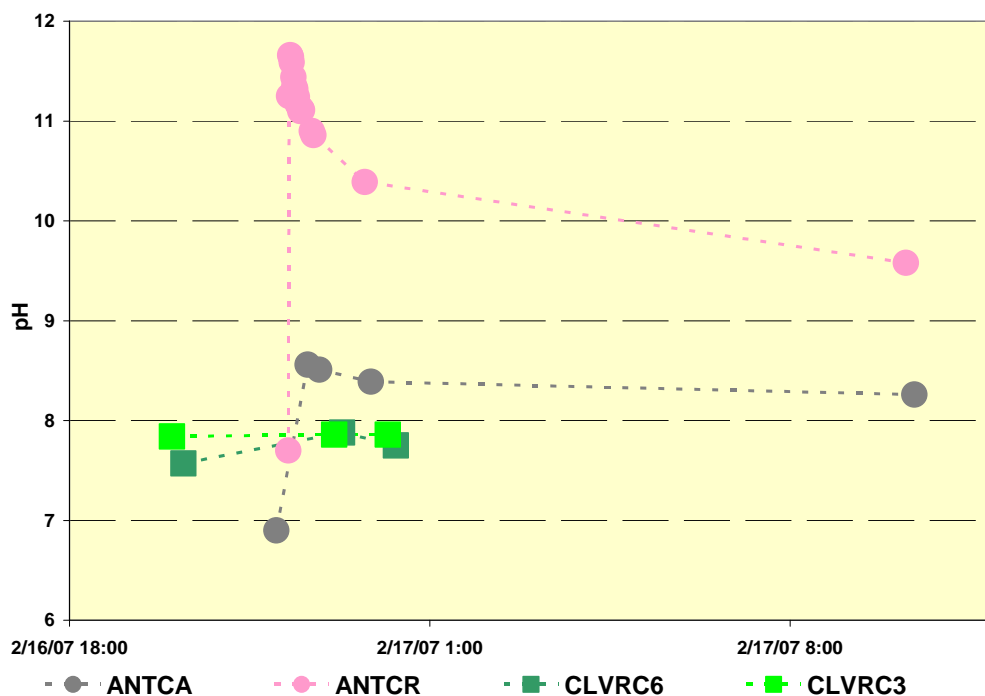


FIGURE 6-17
MEASURED PH LEVELS AT CLOVER VALLEY CREEK WATERSHED SITES
DURING FEBRUARY 16, 2007, CANAL LINING EVENT

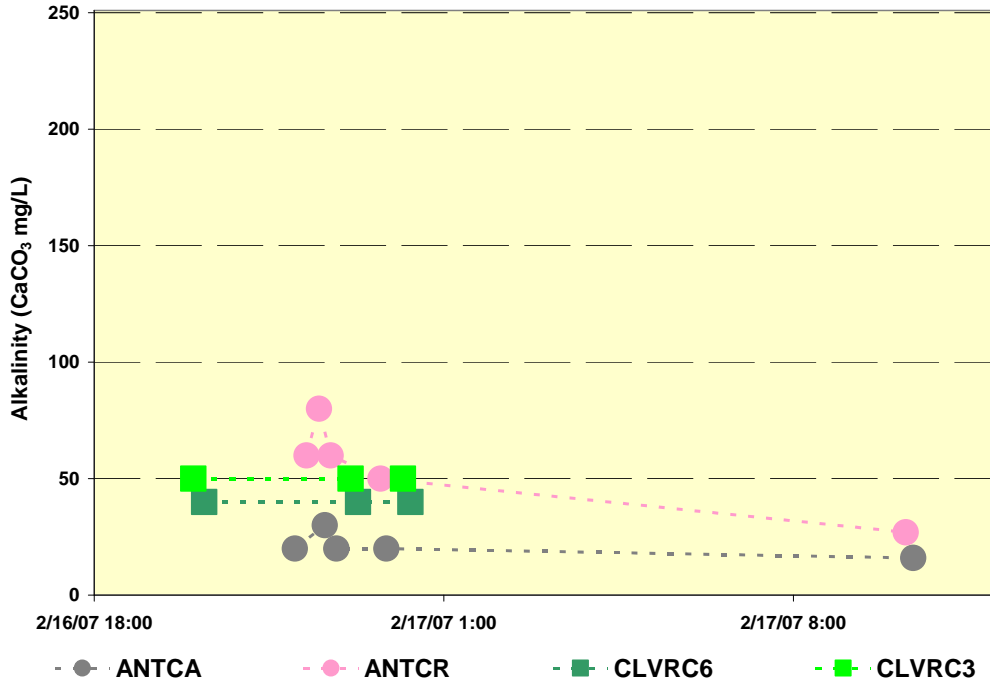


FIGURE 6-18
MEASURED ALKALINITY LEVELS AT CLOVER VALLEY CREEK WATERSHED
SITES DURING FEBRUARY 16, 2007, CANAL LINING EVENT

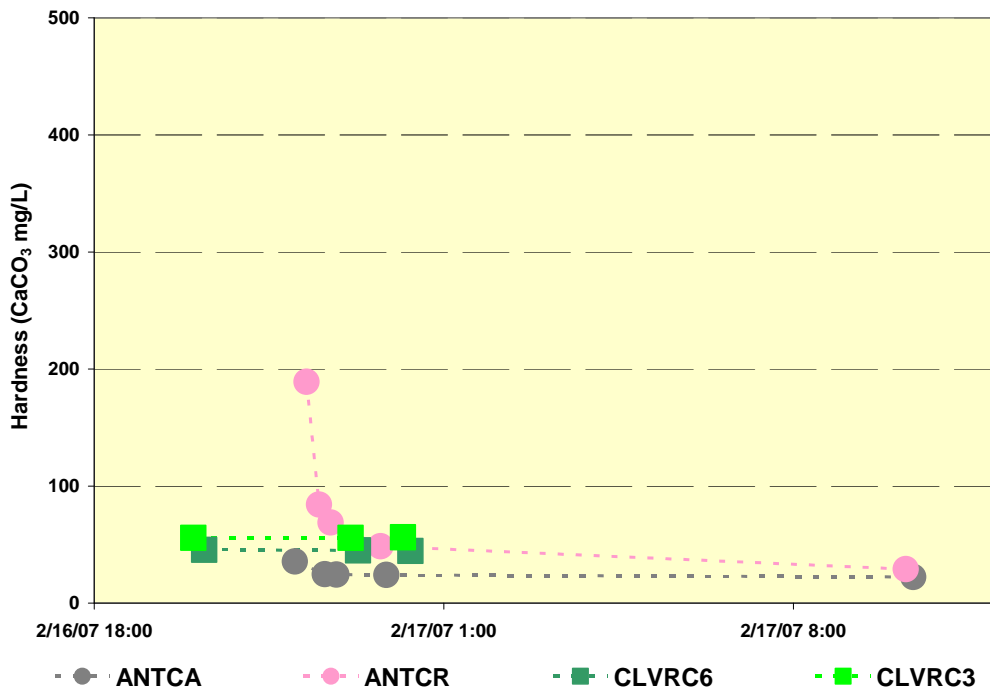


FIGURE 6-19
MEASURED HARDNESS LEVELS AT CLOVER VALLEY CREEK WATERSHED
SITES DURING FEBRUARY 16, 2007, CANAL LINING EVENT

Total Suspended Solids and Turbidity

TSS and turbidity levels measured at ANTCR were very high for a short duration (about 1 hour) after flows were restored to Antelope Canal following canal lining, but were also comparably high upstream from the canal lining, at ANTCA. Samples collected at Clover Valley Creek sites suggest that Clover Valley Creek TSS and turbidity conditions, however, were not affected by canal lining. TSS and turbidity levels at Clover Valley Creek watershed sites from the canal lining monitoring event are shown in **Figures 6-20** and **6-21**.

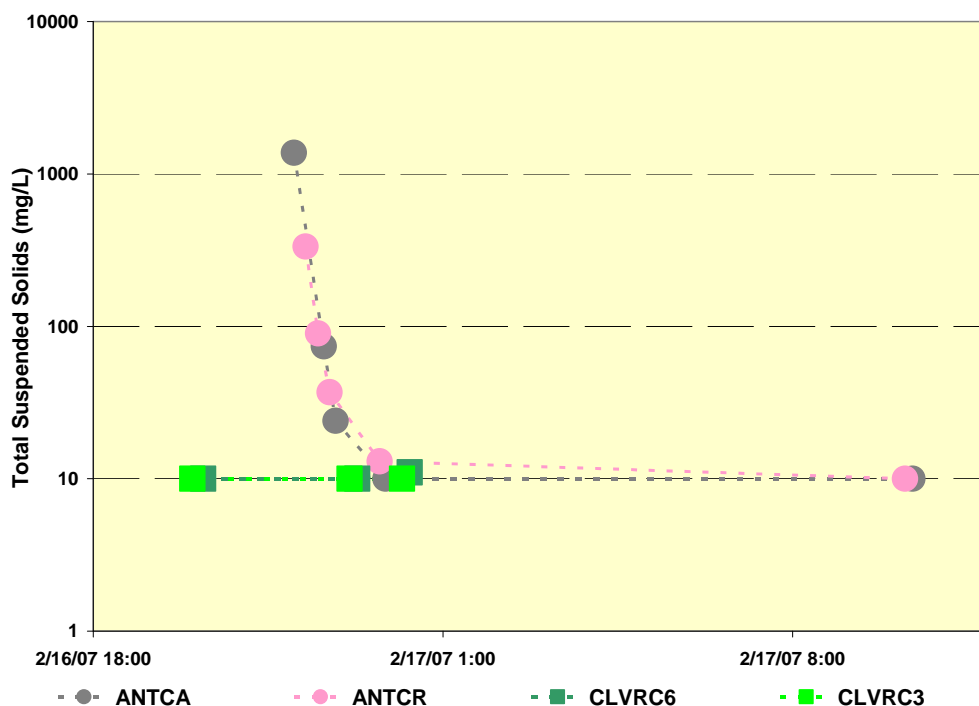


FIGURE 6-20
MEASURED TOTAL SUSPENDED SOLIDS LEVELS AT CLOVER VALLEY CREEK
WATERSHED SITES DURING FEBRUARY 16, 2007, CANAL LINING EVENT

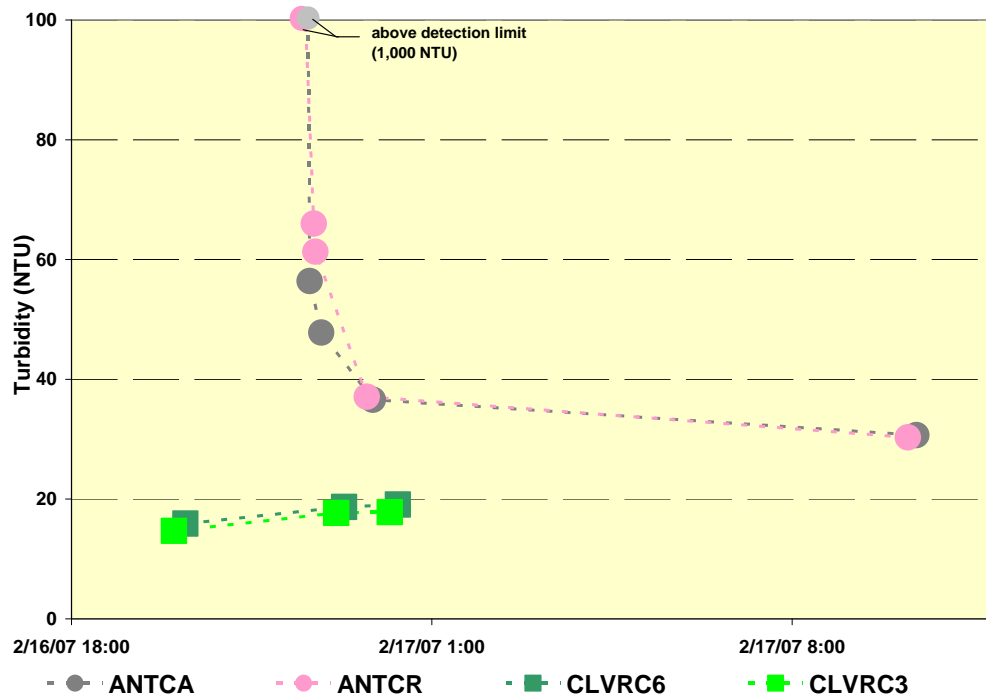


FIGURE 6-21
MEASURED TURBIDITY LEVELS AT CLOVER VALLEY CREEK WATERSHED
SITES DURING FEBRUARY 16, 2007, CANAL LINING EVENT

Specific Conductivity and Ions

SC and ion concentrations (calcium, iron, magnesium, potassium, sodium, chloride, nitrate, sulfate) measured at ANTCR were high for a short duration after flows were restored to Antelope Canal following canal lining, then decreased rapidly. Based on water quality data collected during the sampling event, these elevated levels at ANTCR did not appear to affect SC or major ion concentrations downstream from canal lining at Clover Valley Creek.

Trace Elements

Measured concentrations of aluminum, barium, copper, and zinc at ANTCR were high immediately following the canal lining activity upstream. These high concentrations were likely associated with flushing of sediment and other material that settled after the canal was dewatered for canal cleaning. Aluminum levels measured at CLVRC3 increased following the canal lining activity, but also increased at Clover Valley Creek upstream from the canal lining activity (CLVRC6), suggesting that the increase is not likely associated with the canal lining event. Water quality data collected during the sampling event did not show any effects associated with the canal lining activity on barium, copper, and zinc concentrations at Clover Valley Creek. Aluminum, barium, copper, and zinc results from the canal lining monitoring event are shown in **Figures 6-22 to 6-25**. Cadmium concentrations measured at all sites during the canal cleaning monitoring event were below the detection limit (0.5 µg/L).

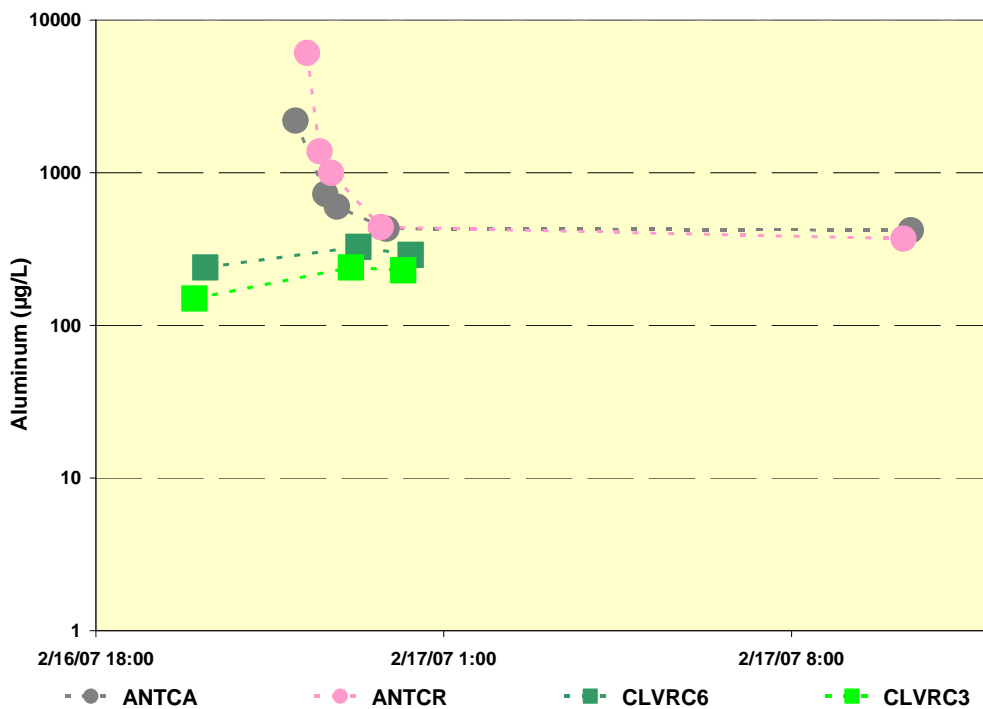


FIGURE 6-22
MEASURED ALUMINUM LEVELS AT CLOVER VALLEY CREEK WATERSHED
SITES DURING FEBRUARY 16, 2007, CANAL LINING EVENT

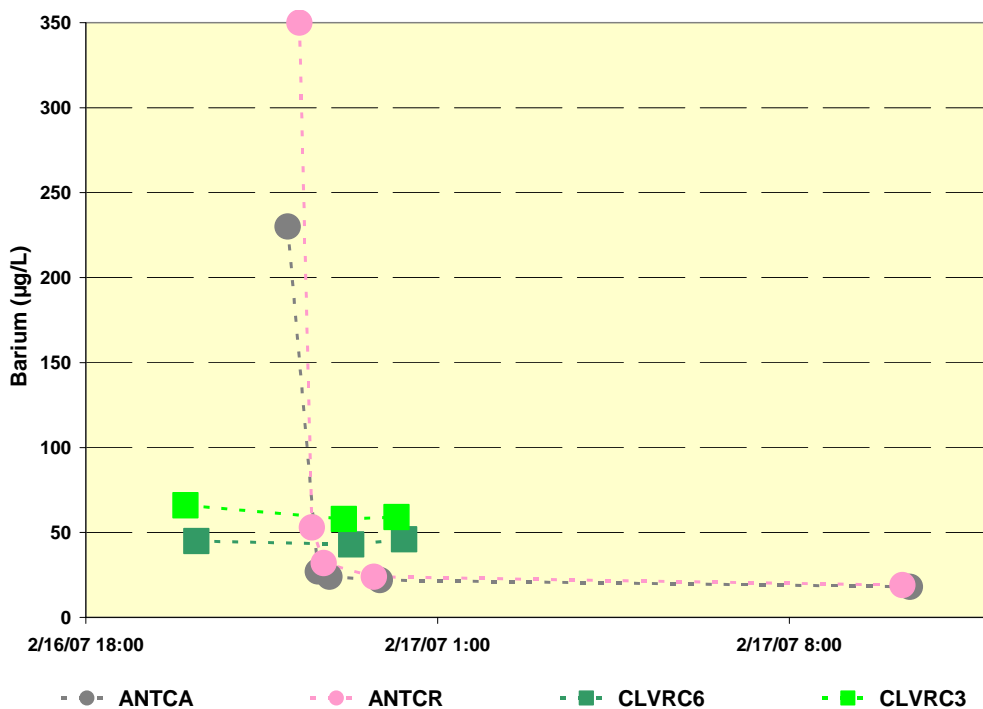


FIGURE 6-23
MEASURED BARIUM LEVELS AT CLOVER VALLEY CREEK WATERSHED
SITES DURING FEBRUARY 16, 2007, CANAL LINING EVENT

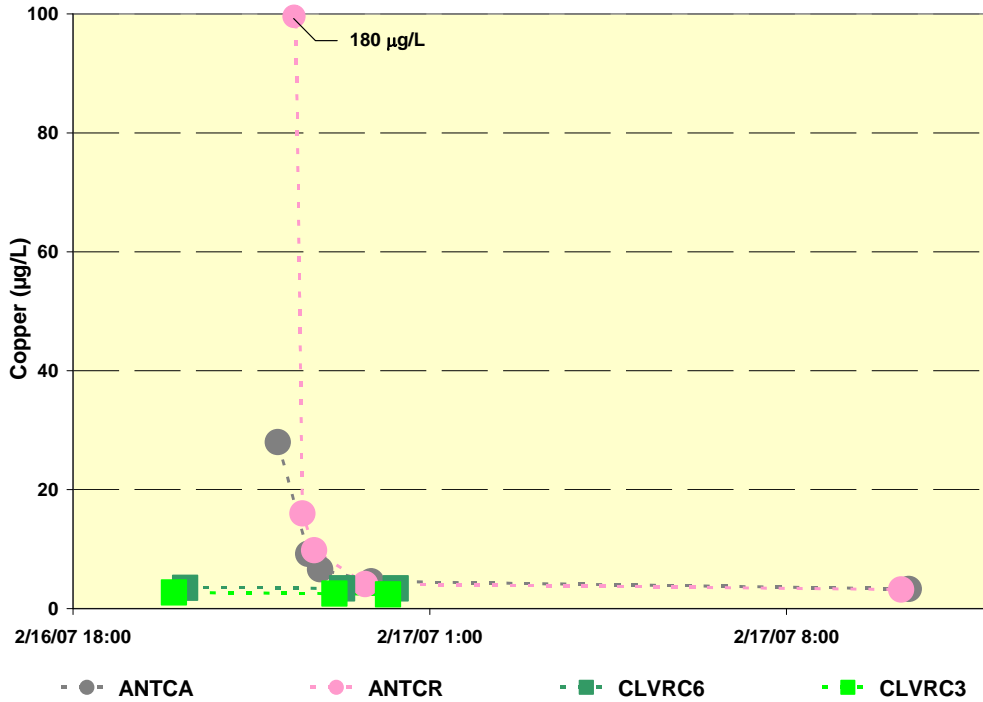


FIGURE 6-24
MEASURED COPPER LEVELS AT CLOVER VALLEY CREEK WATERSHED SITES
DURING FEBRUARY 16, 2007, CANAL LINING EVENT

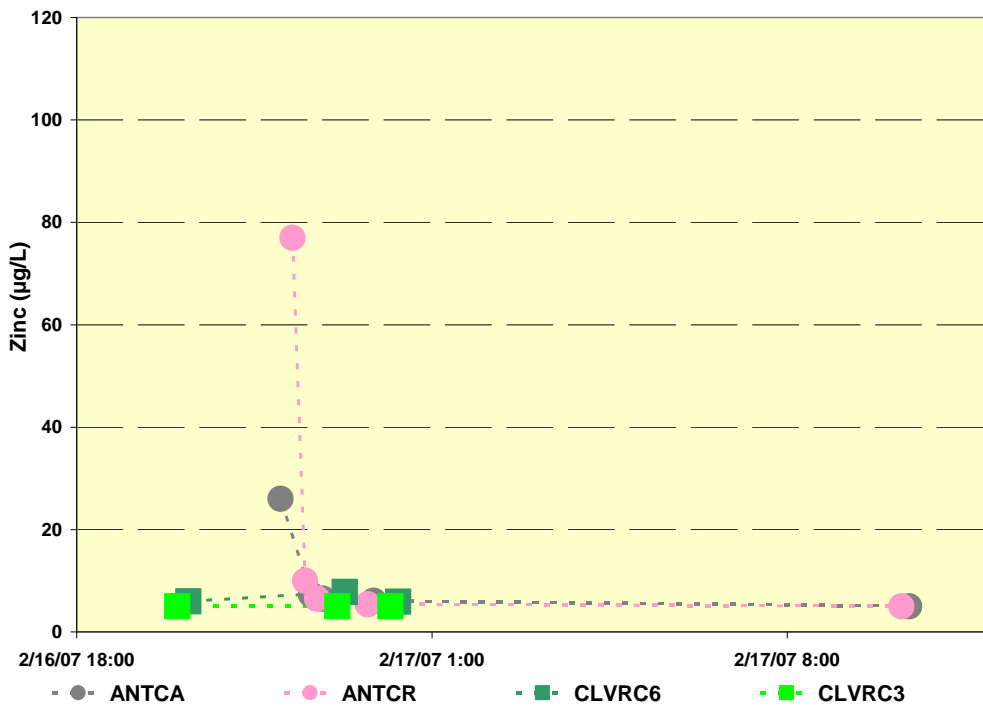


FIGURE 6-25
MEASURED ZINC LEVELS AT CLOVER VALLEY CREEK WATERSHED SITES
DURING FEBRUARY 16, 2007, CANAL LINING EVENT

Secret Ravine Watershed

Water quality conditions in the Secret Ravine watershed were evaluated at the following sites after canal lining/guniting activities along a section of the Boardman Canal downstream from the head of the Baughman Canal on March 20, 2007:

- **Boardman below the head of Baughman Canal (YB155):** located along the Boardman Canal just below the head of the Baughman Canal.
- **Boardman downstream from YB155 (YB155DS):** located downstream from the lined section along the Boardman Canal.
- **Boardman Canal Outlet Release (BOARDMANCR)**
- **Secret Ravine at Rocklin Road (SECRETRV3)**
- **Secret Ravine at Roseville Parkway (SECRETRV2)**

Water Temperature and Dissolved Oxygen

Water quality results suggest that the canal lining/guniting activity monitored did not affect water temperature or DO conditions in Secret Ravine. Minimal to no effects on water temperature and DO were observed in Secret Ravine following canal lining/guniting along the Boardman Canal. DO levels increased slightly at YB155DS and BOARDMANCR for a short duration after flows were restored to the canal following the canal lining.

pH, Alkalinity, and Hardness

Measured values for pH, alkalinity, and hardness at Secret Ravine did not appear to be affected by canal lining activities. The pH levels observed at YB155DS increased to very high levels (up to 11.62) following the canal lining activity, and also increased slightly at BOARDMANCR, but did not affect pH at SECRETRV2. These results of pH measurements are shown in **Figure 6-26**. Alkalinity and hardness values at YB155DS increased after canal lining, but these increases did not result in an increase to alkalinity or hardness for samples collected at BOARDMANCR or SECRETRV2.

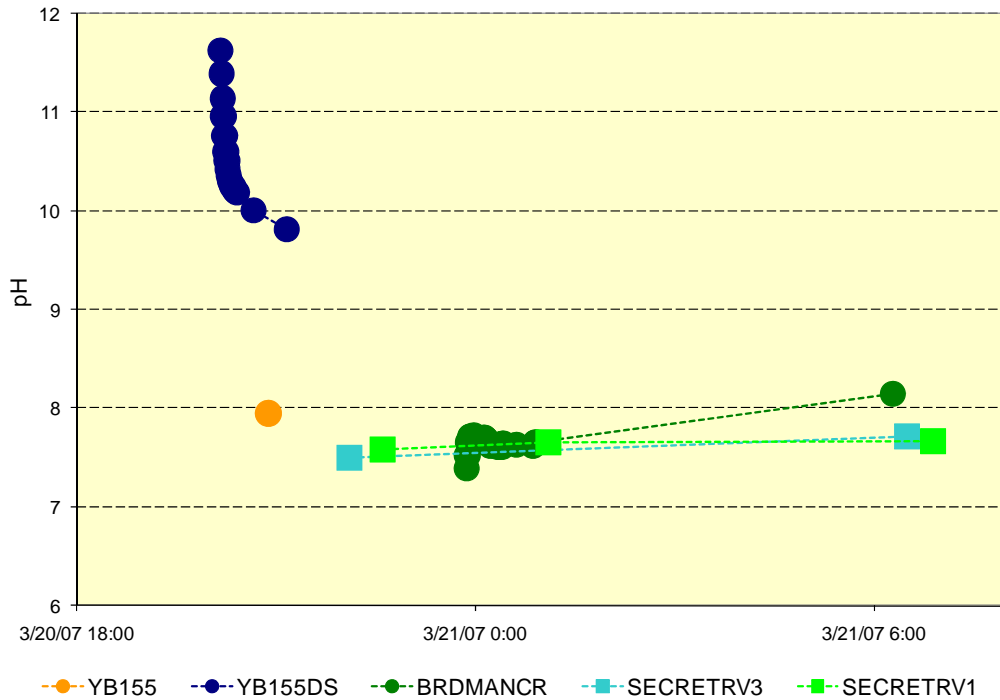


FIGURE 6-26
MEASURED PH LEVELS AT SECRET RAVINE WATERSHED SITES DURING
MARCH 20, 2007, CANAL LINING EVENT

Total Suspended Solids and Turbidity

Despite increases in TSS and turbidity values at YB155DS and BOARDMANCR, TSS and turbidity values measured at SECRETRV2 do not appear to be affected by canal cleaning activities. The high TSS and turbidity values measured at canal sites downstream from the canal lining activity are likely associated with flushing of sediment and other material that settled after the canal was dewatered for canal cleaning.

Specific Conductivity and Ions

SC, calcium, iron, magnesium, potassium, sodium, chloride, nitrate, and sulfate concentrations all increased at YB155DS following canal cleaning, similar to TSS and turbidity. These increases upstream, however, did not appear to affect SC and ion concentrations at the Boardman Canal Outlet release to Secret Ravine or at SECRETRV2.

Trace Elements

Measured concentrations of aluminum were high across all sites evaluated during the canal lining monitoring event, with highest values at YB155DS immediately after flows were restored to the canal below the canal lining activity. Because aluminum concentrations were high in all samples collected during the event, aluminum levels in Secret Ravine are not likely affected by canal lining activities. Barium, copper, and zinc concentrations also increased at YB155DS after flows were restored to Boardman Canal below the canal lining activity. Based on water quality

results, concentrations of these constituents in Secret Ravine do not appear to be affected by canal lining activities upstream.

Miners Ravine Watershed

Water quality conditions in the Miners Ravine watershed were evaluated after a section of the Boardman Canal near Laird Pump was lined on March 15, 2007. The sites monitored during the event include:

- **Boardman Canal near Laird Pump, upstream (315BDU):** located along the Boardman Canal near Laird Pump, upstream from the lining/guniting event.
- **Boardman Canal near Laird Pump, downstream (315BDD):** located along the Boardman Canal near Laird Pump, downstream from the lining/guniting event.
- **Baughman Canal Outlet Release (BAUGHMANCR)**
- **Tributary to Miners Ravine from Baughman Canal (BCTTRIB1)**
- **Miners Ravine at Moss Lane (MINERSRV5)**

Due to the extensive length of the unnamed tributary to Miners Ravine from Baughman Canal and long travel time from BAUGHMANCR to BCTTRIB1, samples obtained during canal lining activities at BCTTRIB1 and MINERSRV5 were intended to provide a relative comparison of water quality conditions in receiving waters downstream from BAUGHMANCR.

Water Temperature and Dissolved Oxygen

Water temperature and DO conditions at stream sites in the Miners Ravine watershed did not appear to be affected by canal lining/guniting activities along the Boardman Canal. DO levels temporarily decreased then increased at 315DD and BAUGHMANCR, but these fluctuations are not likely to affect conditions at stream sites in the Miners Ravine watershed.

pH, Alkalinity, and Hardness

Measured values of pH, alkalinity, and hardness increased to very high levels at 315DD following canal lining activities, but are not likely to affect conditions at Miners Ravine. Values for pH measured at BAUGHMANCR also increased for a short duration, then gradually decreased and stabilized to baseline levels. Results from pH measurements at Miners Ravine watershed sites during the canal lining monitoring event are shown in **Figure 6-27**.

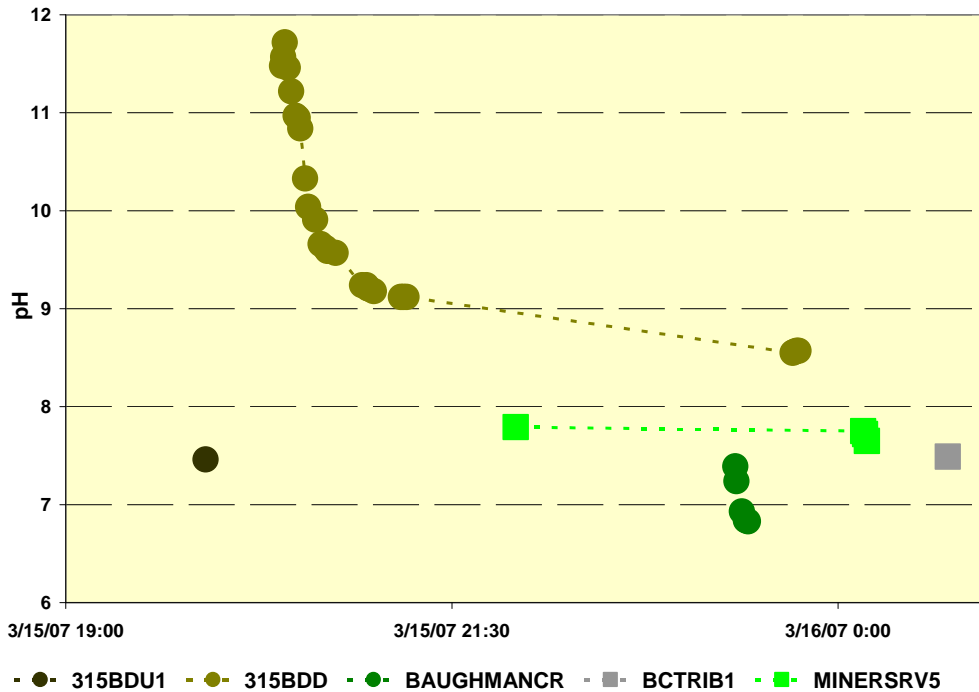


FIGURE 6-27
MEASURED PH LEVELS AT MINERS RAVINE WATERSHED SITES DURING
MARCH 15, 2007, CANAL LINING EVENT

Total Suspended Solids and Turbidity

TSS and turbidity values measured at 315BDD and BAUGHMANCR increased after flows were restored to the canals following canal lining. Turbidity measured at BAUGHMANCR the exceeded detection limit (1,000 NTUs) for some samples. These increases were not likely to affect TSS and turbidity conditions in Miners Ravine. Similar to other canal dewatering activities, these high TSS and turbidity values are likely associated with flushing of sediment and other material that settled after the canal was dewatered for canal lining.

Specific Conductivity and Ions

SC and ion concentrations at Miners Ravine watershed sites exhibited a similar response to canal lining activities as those described for Clover Valley Creek and Secret Ravine watershed sites. SC increased for a short duration at 315BDD, but these increases were not likely to affect conditions downstream in Miners Ravine. Similar trends were observed with calcium, iron, magnesium, potassium, sodium, chloride, nitrate, and sulfate concentrations.

Trace Elements

Aluminum concentrations measured at all Miners Ravine watershed sites during the canal lining event were high, with the highest values at 315BDD immediately after flows were restored to the canal below the canal cleaning activity. Measured barium, copper, and zinc values at 315BDD were also high immediately following the canal lining activity. Sample concentrations of aluminum, copper, and zinc also increased at MINERSRV5 during the event. These increases at MINERSRV5 are not likely to be specifically associated with the canal lining activity, because

MINERSRV5 is upstream from direct canal system inputs to Miners Ravine streamflow, but may be related to canal cleaning activities that occurred within the canal system on March 15, 2007.

Measured concentrations of aluminum were high across all sites in the Miners Ravine watershed evaluated during the canal cleaning monitoring event, with highest values at BAUGHMANCR immediately after flows were restored to the canal below the canal lining activity. Because aluminum concentrations were high in all samples collected during the event, aluminum levels in Miners Ravine are not likely affected by canal lining activities. Barium, copper, and zinc concentrations also increased at YB155DS after flows were restored to Boardman Canal below the canal cleaning activity. Based on water quality results, concentrations of these constituents in Miners Ravine do not appear to be affected by canal lining activities upstream. **Figures 6-28 to 6-31** show aluminum, barium, copper, and zinc results for Miners Ravine watershed sites during the monitoring event for canal lining.

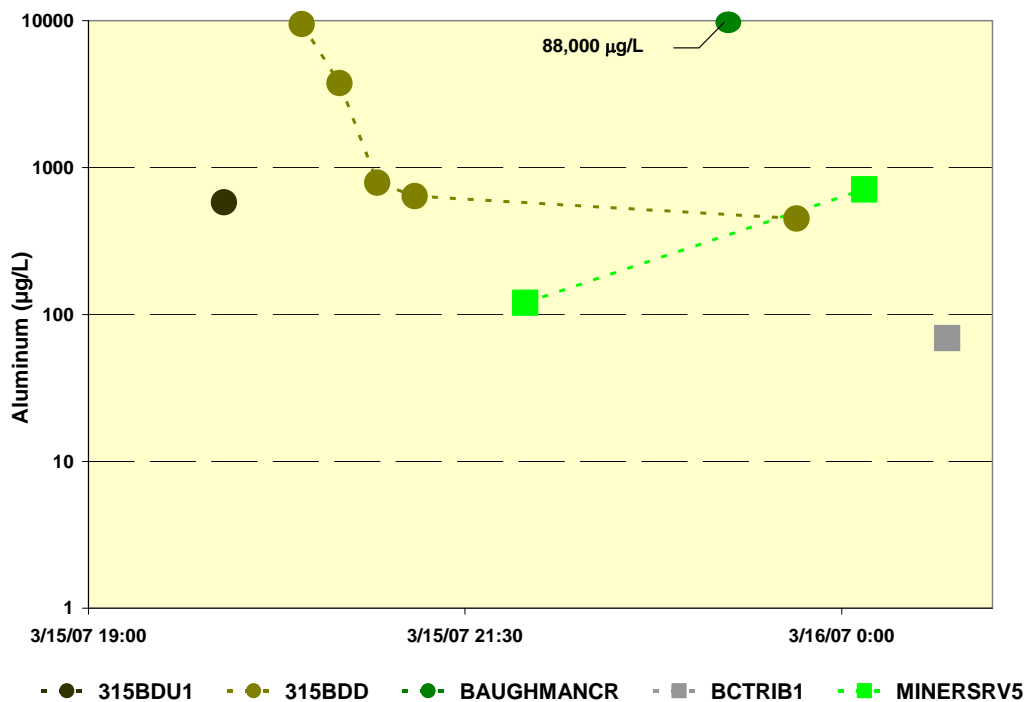


FIGURE 6-28
MEASURED ALUMINUM LEVELS AT MINERS RAVINE WATERSHED SITES
DURING MARCH 15, 2007, CANAL LINING EVENT

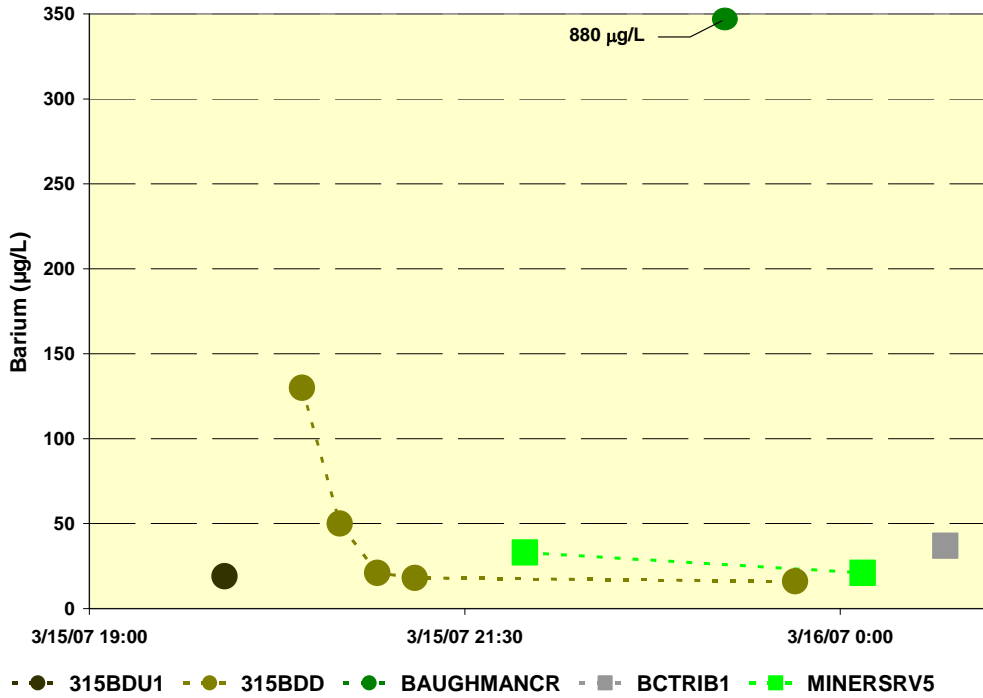


FIGURE 6-29
MEASURED BARIUM LEVELS AT MINERS RAVINE WATERSHED SITES DURING
MARCH 15, 2007, CANAL LINING EVENT

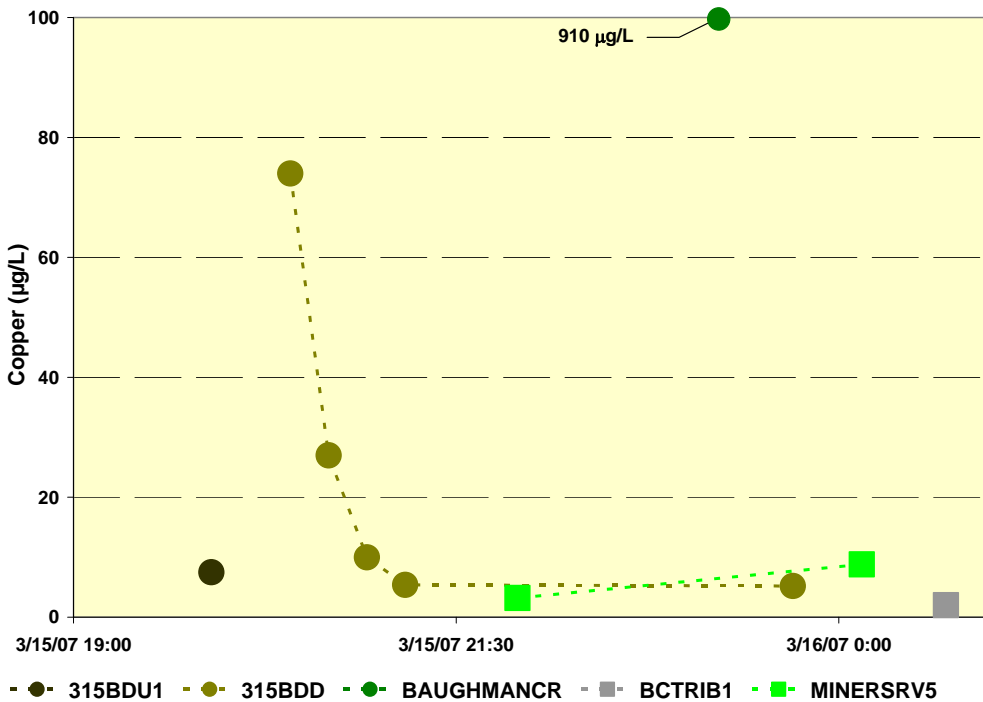


FIGURE 6-30
MEASURED COPPER LEVELS AT MINERS RAVINE WATERSHED SITES DURING
MARCH 15, 2007, CANAL LINING EVENT

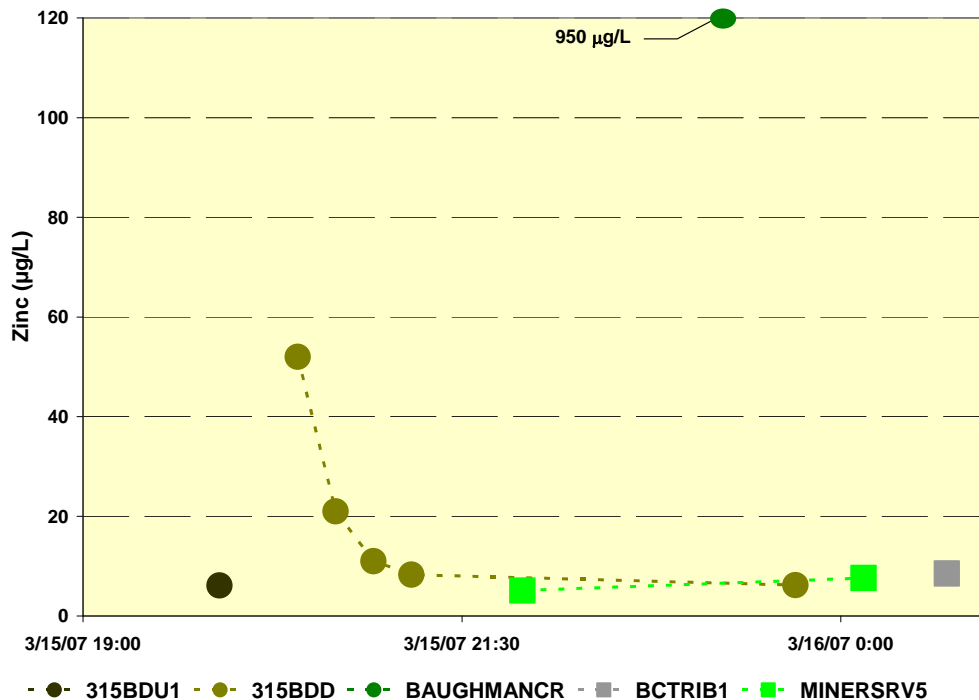


FIGURE 6-31
MEASURED ZINC LEVELS AT MINERS RAVINE WATERSHED SITES DURING
MARCH 15, 2007, CANAL LINING EVENT

Soils and Sediment Quality

The potential effects of canal lining/guniting activities are similar to those described above for canal cleaning activities. Canal lining activities may introduce additional copper to study area soils through the removal of sediments from the canal with higher copper concentrations attributed to PCWA's algacide applications, and deposition of the soils along the canal banks. Additionally, the concrete applied during canal lining activities may increase concentrations of the concrete chemical constituents at the locations of the canal lining activities. Soil compaction and erosion may occur as a result of equipment access and use along canal banks during canal cleaning and lining. Mechanical equipment may also introduce chemical contaminants (i.e., petroleum products) to soils at access sites.

Biological Resources

Terrestrial Habitat and Species

Minimal streamflow decreases in study area streams due to a short duration reduction of flows in the PCWA canal system during canal lining could result in temporary and very minimal decreases in the extent of wetland habitats that may be directly or indirectly supported by canal system operations. This could have minimal effects on species that use these wetland habitats, such as foraging birds and breeding amphibians, by decreasing the amount of available habitat. Reductions in water levels could expose amphibian eggs in the shallow, vegetated margins of drainages or adjacent wetlands. Any potential effects from temporary water reductions on species that use these habitats are expected to be minimal because canal system contributions to

flow within study area streams through unregulated releases from canal outlets are variable. The typical timing of canal lining is during winter, generally outside of the breeding period for most amphibian species; however, canal lining activities can occur throughout the year.

Lining sections of unlined canals may indirectly affect adjacent habitat and species historically supported by canal seepage. Through lining sections of previously unlined canals, oak trees and wetlands may be negatively affected by the decreased seepage along the sections and the resultant change in soil moisture and geochemical conditions.

Potential effects on water quality discussed above could indirectly affect terrestrial habitats and species. Increased loading of sediments and sedimentation from flushing activities could bury amphibian eggs. Increased concentrations of trace elements (such as aluminum and copper) could have some negative effects on plants and wildlife on the margins of canals and tributaries. Amphibians in particular are known to be sensitive to such water quality changes, although effects vary dramatically by type and concentration of contaminant, species, and water quality parameters. Elevated pH values are toxic to amphibians, and may be particularly harmful in combination with other contaminants, such as heavy metals or herbicides, particularly glyphosates (Pesticide Action Network U.K. 1996, Edginton et al. 2004, Horn and Dunson 1995). However, glyphosates and triclopyr have been found to break down faster under higher pH conditions (Tu et al. 2001).

Habitats and species could potentially be affected directly or indirectly by impacts to soils and sediments from equipment used during canal lining, including compaction, erosion, and introduction of petroleum products. Effects on habitats and species could include plant mortality or decreased plant growth. These types of impacts are expected to be relatively minimal and small in aerial extent.

Some potential negative effects could occur if raptors are nesting near canal lining work areas that may be disturbed by noise. Raptors potentially occurring in the study area include Red-shouldered Hawk, American Kestrel, Red-tailed Hawk, and Great Horned Owl. The nesting period for raptors is generally March 1 to August 15.

Aquatic Habitat and Species

Potential effects to of canal lining activities on aquatic habitat and species are likely similar to those discussed described above for canal cleaning activities.

Special Status Species

As described above, minimal streamflow decreases in study area streams due to a short duration reduction of flows in the PCWA canal system during canal lining could result in temporary and very minimal decreases in the extent of wetland habitats that may be indirectly supported by canal deliveries. This could have minimal effects on special status species that use these wetland habitats, such as special status foraging birds and breeding amphibians, by decreasing the amount of available habitat. Reductions in water levels could expose special status amphibian eggs in the shallow, vegetated margins of drainages or adjacent wetlands. Any potential effects from temporary water reductions on species that use these habitats are expected to be minimal because canal system contributions to flow within study area streams through unregulated

releases from canal outlets are variable. Potential effects may be greater during the breeding season for special status amphibian species. The California red-legged frog breeding occurs between late November and March, though most frogs lay eggs in March (USFWS 2002, Stebbins 2003). The foothill yellow-legged frog breeds between mid-March through early June, and the western spadefoot toad breeds late January through July (Stebbins 2003).

Sediment loading to streams after flows are restored to canals following canal lining activities and sedimentation may bury special status amphibian eggs, if present. Increases in concentrations of trace elements, such as aluminum and copper, could have some negative effects on special status plants and wildlife, if present, on the margins of canals and tributaries. Amphibians in particular are known to be sensitive to changes in water quality conditions, although effects vary dramatically by species, life stage, and water quality parameters. Also, increases in pH levels, which were observed at sites after canal lining activities during water quality monitoring events, have been found to be toxic to amphibians, and may be particularly harmful in combination with other contaminants, such as heavy metals or herbicides (Pesticide Action Network U.K. 1996, Edginton et al. 2004, Horn and Dunson 1995).

Special status plant species (**Tables 3-12** and **3-13**), if present, could potentially be affected directly or indirectly by impacts to soils and sediments from equipment used during canal lining, including compaction, erosion, and introduction of petroleum products. Effects on special status plant species could include mortality or decreased growth. These types of impacts are expected to be unlikely to occur.

Some potential negative effects could occur if special status raptor species are nesting near work areas that may be disturbed by noise. Special status raptors potentially occurring in the study area include Swainson's hawk, Cooper's hawk, Northern Goshawk, White-tailed Kite, and Northern Harrier. As mentioned above, the nesting period for raptors is generally March 1 to August 15.

Potential effects of canal lining activities on Chinook salmon and steelhead are the same as described for aquatic habitat and species, and likely similar to those discussed for canal cleaning activities.

6.1.2.2 Canal Repair

PCWA performs repair and/or replacement of canals, flumes, outlet structures, flow-control structures, and customer delivery points throughout the PCWA canal system on a scheduled and as-needed basis. These activities may involve minor repairs with minimal disturbance to customer deliveries and minor effects on environmental resources, while others requiring onsite construction may become more involved. The potential effects of canal repair activities on natural resource conditions are dependent of the nature and extent of the canal repair, as well as the specific environmental setting for the activity. These 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. The following sections provide an overview of the types of effects on natural resources that may occur during PCWA's canal repair activities.

Physical Resources

The following sections describe potential effects of PCWA canal repair activities on physical resources in the study area.

Hydrology

Most canal repair activities would result in short-duration interruptions to water flow within segments of the raw water distribution system. These short-duration interruptions to flow are not are likely to affect hydrologic conditions in study area streams.

Canal repair activities requiring onsite construction and canal dewatering for more than a day should warrant a project-specific evaluation to determine potential effects on hydrologic conditions in study area streams.

Water Quality

Although no water quality data was collected during canal repair events, potential effects for canal repair activities are expected to be similar to other canal dewatering and flushing activities. In some cases, equipment may be staged inside the canal during repair. The settling, then mobilization of sediments, organic material, and constituents associated with particulates during flushing activities may result in temporary fluctuations in constituent concentrations. For example, a temporary increase in water temperatures and associated decrease in DO levels may occur. In the case of canal repair, temporary increases in TSS and turbidity are likely because sediment may be disturbed along the canals during repair work. However, these temporary changes are not likely to have substantial effects, if any, along drainage or stream sites downstream from canal repair activities.

Canal repair projects may involve the use of mechanical equipment that require hazardous materials, such as gasoline and diesel fuels, engine oil, and hydraulic fluids. Accidental spills of these substances may contaminate the canal water and receiving water tributaries and streams, adjacent soils, and other riparian habitat.

Soils and Sediment Quality

Soils and sediment quality in the study area may be affected by canal repair activities. Soil compaction and erosion may occur as a result of construction equipment access and use along canal banks. Construction equipment may also introduce chemical contaminants (i.e., petroleum products) to soils at project sites.

Biological Resources

Terrestrial Habitat and Species

Effects on terrestrial habitat and species from canal repair would vary based on the type of repair required, but would be similar to those from canal lining, though generally less severe and smaller in scale.

As with canal lining, minimal streamflow decreases in study area streams due to a short duration reduction of flows in the PCWA canal system during canal repair could result in temporary and very minimal decreases in the extent of wetland habitats that may be directly or indirectly supported by canal system operations. This could have minimal effects on species that use these wetland habitats, such as foraging birds and breeding amphibians, by decreasing the amount of

available habitat. Reductions in water levels could expose amphibian eggs in the shallow, vegetated margins of drainages or adjacent wetlands. Any potential effects from temporary water reductions on species that use these habitats are expected to be minimal.

As with canal lining, potential effects on water quality discussed above could indirectly affect terrestrial habitats and species. Increased loading of sediments and sedimentation from flushing activities could bury amphibian eggs. Increased concentrations of trace elements (such as aluminum and copper) could have some negative effects on plants and wildlife on the margins of canals and tributaries. Amphibians in particular are known to be sensitive to such water quality changes, although effects vary dramatically by type and concentration of contaminant, species, and water quality parameters.

Habitats and species could potentially be affected directly or indirectly by impacts to soils and sediments from equipment used during canal repair, including compaction, erosion, and introduction of petroleum products. Effects on habitats and species could include plant mortality or decreased plant growth. These types of impacts are expected to be relatively minimal and small in aerial extent.

Minimal loss of habitat could occur due to limited trimming or removal of vegetation necessary to access repair areas.

Some potential negative effects could occur if raptors are nesting near canal repair work areas that may be disturbed by noise. Raptors potentially occurring in the study area include Red-shouldered Hawk, American Kestrel, Red-tailed Hawk, and Great Horned Owl. The nesting period for raptors is generally March 1 to August 15.

Aquatic Habitat and Species

Potential effects to of canal repair activities on aquatic habitat and species are likely similar to those discussed described above for canal cleaning activities. In addition, construction-related contaminants could result in a reduction in the growth, survival, and reproductive success of aquatic species. The potential exists for fuel and concrete to spill into the waterway during construction. Various contaminants introduced into the water system, either directly or through surface runoff, may be toxic to fish or cause altered oxygen diffusion rates and acute and chronic toxicity to aquatic organisms, thereby reducing growth and survival.

Special Status Species

Effects on special status species from canal repair would vary based on the type of repair required, but would be similar to those from canal lining, though generally less severe and smaller in scale.

As described above, minimal streamflow decreases in study area streams due to a short duration reduction of flows in the PCWA canal system during canal repair could result in temporary and very minimal decreases in the extent of wetland habitats that may be indirectly supported by canal deliveries. This could have minimal effects on special status species that use these wetland habitats, such as special status foraging birds and breeding amphibians, by decreasing the amount of available habitat. Reductions in water levels could expose special status amphibian eggs in the shallow, vegetated margins of drainages or adjacent wetlands. Any potential effects

from temporary water reductions on species that use these habitats are expected to be minimal because canal system contributions to flow within study area streams are variable. Potential effects may be greater during the breeding season for special status amphibian species. California red-legged frog breeding occurs between late November and March, though most frogs lay eggs in March (USFWS 2002, Stebbins 2003). The foothill yellow-legged frog breeds between mid-March through early June, and the western spadefoot toad breeds late January through July (Stebbins 2003).

Sediment loading to streams after flows are restored to canals following canal repair activities and sedimentation may bury special status amphibian eggs, if present. Increases in concentrations of trace elements, such as aluminum and copper, could have some negative effects on special status plants and wildlife, if present, on the margins of canals and tributaries. Amphibians in particular are known to be sensitive to changes in water quality conditions, although effects vary dramatically by species, life stage, and water quality parameters.

Special status plant species (**Tables 3-12 and 3-13**), if present, could potentially be affected directly or indirectly by impacts to soils and sediments from equipment used during canal repair, including compaction, erosion, and introduction of petroleum products. Special status plant species, if present, could also be damaged or killed during limited trimming or removal of vegetation necessary to access repair areas. Effects on special status plant species could include mortality or decreased growth. These types of impacts are expected to be unlikely to occur.

Some potential negative effects could occur if special status raptor species are nesting near work areas that may be disturbed by equipment noise during canal repair activities. Special status raptors potentially occurring in the study area include Swainson's hawk, Cooper's hawk, Northern Goshawk, White-tailed Kite, and Northern Harrier. As mentioned above, the nesting period for raptors is generally March 1 to August 15.

Potential effects of canal repair activities on Chinook salmon and steelhead are the same as for the aquatic habitat and species described above.

6.1.2.3 Pipe Repair

PCWA performs repair and/or replacement of pipes, culverts, and siphons throughout the PCWA canal system on a scheduled and as-needed basis. These activities may involve minor repairs with minimal disturbance to customer deliveries and minor effects on environmental resources, while others requiring onsite construction may become more involved. As described above for canal repair activities, the potential effects of pipe repair activities on natural resource conditions are dependent of the nature and extent of the pipe repair, as well as the specific environmental setting for the activity. These 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. The following sections provide an overview of the types of effects on natural resources that may occur during PCWA's pipe repair activities.

Physical Resources

Hydrology

Most pipe repair activities would result in short-duration interruptions to water flow within segments of the raw water distribution system. These short-duration interruptions to flow are not likely to affect hydrologic conditions in study area streams.

Pipe repair activities requiring onsite construction and canal dewatering for more than a day should warrant a project-specific evaluation to determine potential effects on hydrologic conditions in study area streams.

Water Quality

Although no water quality data was collected during pipe repair events, potential effects for pipe repair activities are also expected to be similar to other canal dewatering and flushing activities. During pipe repair, sediment is often excavated and heavy machinery may be used. The equipment may be staged inside the canal and/or along canal banks during repair. The settling, then mobilization of sediments, organic material, and constituents associated with particulates during flushing activities may result in temporary fluctuations in constituent concentrations. The largest effects, if any, are likely to be temporary increases in TSS and turbidity downstream from pipe repair work.

Soils and Sediment Quality

Soils and sediment quality in the study area may be affected by pipe repair activities. Soil compaction and erosion may occur as a result of construction equipment access and use along canal banks. Construction equipment may also introduce chemical contaminants (i.e., petroleum products) to soils at project sites.

Biological Resources

Terrestrial Habitat and Species

Effects on terrestrial habitat and species from pipe repair would vary based on the type and magnitude of repair required, but would be similar to those from canal repair.

As with canal lining and repair, minimal streamflow decreases in study area streams due to a short duration reduction of flows in the PCWA canal system during pipe repair could result in temporary and very minimal decreases in the extent of wetland habitats that may be directly or indirectly supported by canal system operations. This could have minimal effects on species that use these wetland habitats, such as foraging birds and breeding amphibians, by decreasing the amount of available habitat. Reductions in water levels could expose amphibian eggs in the shallow, vegetated margins of drainages or adjacent wetlands. Any potential effects from temporary water reductions on species that use these habitats are expected to be minimal.

As with canal repair, potential effects on water quality discussed above could indirectly affect terrestrial habitats and species. Increased loading of sediments and sedimentation from flushing activities could bury amphibian eggs. Increased concentrations of trace elements (such as aluminum and copper) could have some negative effects on plants and wildlife on the margins of canals and tributaries. Amphibians in particular are known to be sensitive to such water quality

changes, although effects vary dramatically by type and concentration of contaminant, species, and water quality parameters.

Habitats and species could potentially be affected directly or indirectly by impacts to soils and sediments from equipment used during pipe repair, including compaction, erosion, and introduction of petroleum products. Effects on habitats and species could include plant mortality or decreased plant growth. These types of impacts are expected to be relatively minimal and small in aerial extent.

Minimal loss of habitat could occur due to limited trimming or removal of vegetation necessary to access repair areas.

Some potential negative effects could occur if raptors are nesting near pipe repair work areas that may be disturbed by noise. Raptors potentially occurring in the study area include Red-shouldered Hawk, American Kestrel, Red-tailed Hawk, and Great Horned Owl. The nesting period for raptors is generally March 1 to August 15.

Aquatic Habitat and Species

Potential effects of pipe repair activities on aquatic habitat and species are likely similar to those discussed for canal repair activities.

Special Status Species

Effects on special status species from pipe repair would vary based on the type and magnitude of repair required, but would be similar to those from canal repair.

As described above, minimal streamflow decreases in study area streams due to a short duration reduction of flows in the PCWA canal system during pipe repair could result in temporary and very minimal decreases in the extent of wetland habitats that may be indirectly supported by canal deliveries. This could have minimal effects on special status species that use these wetland habitats, such as special status foraging birds and breeding amphibians, by decreasing the amount of available habitat. Reductions in water levels could expose special status amphibian eggs in the shallow, vegetated margins of drainages or adjacent wetlands. Any potential effects from temporary water reductions on species that use these habitats are expected to be minimal. Potential effects may be greater during the breeding season for special status amphibian species. The California red-legged frog breeding occurs between late November and March, though most frogs lay eggs in March (USFWS 2002, Stebbins 2003). The foothill yellow-legged frog breeds between mid-March through early June, and the western spadefoot toad breeds late January through July (Stebbins 2003).

Sediment loading to streams after flows are restored to canals following canal repair activities and sedimentation may bury special status amphibian eggs, if present. Increases in concentrations of trace elements, such as aluminum and copper, could have some negative effects on special status plants and wildlife, if present, on the margins of canals and tributaries. Amphibians in particular are known to be sensitive to changes in water quality conditions, although effects vary dramatically by species, life stage, and water quality parameters.

Special status plant species (**Tables 3-12 and 3-13**), if present, could potentially be affected directly or indirectly by impacts to soils and sediments from equipment used during pipe repair, including compaction, erosion, and introduction of petroleum products. Special status plant species, if present, could also be damaged or killed during limited trimming or removal of vegetation necessary to access repair areas. Effects on special status plant species could include mortality or decreased growth. These types of impacts are expected to be unlikely to occur.

Some potential negative effects could occur if special status raptor species are nesting near work areas that may be disturbed by equipment noise during pipe repair activities. Special status raptors potentially occurring in the study area include Swainson's hawk, Cooper's hawk, Northern Goshawk, White-tailed Kite, and Northern Harrier. As mentioned above, the nesting period for raptors is generally March 1 to August 15.

Potential effects of pipe repair activities on Chinook salmon and steelhead are the same as for the aquatic habitat and species described above and likely similar to those discussed for canal repair activities.

6.2 REGULATORY FRAMEWORK FOR POTENTIAL EFFECTS OF MAINTENANCE ACTIVITIES

The following sections provide the regulatory framework for the potential effects of PCWA maintenance activities described above. The regulatory framework discussion is organized by Federal, State, and local regulations, and is summarized in **Table 6-11**.

6.2.1 Federal Regulations

Federal laws and regulations associated with the potential effects of PCWA maintenance activities are described below.

6.2.1.1 Clean Water Act

PCWA activities during canal cleaning activities were found to have minimal effects on water quality conditions in study area streams. Effects of canal cleaning (i.e., increases in temperature, TSS, turbidity, calcium, magnesium, nitrates, aluminum, barium, zinc, and decrease in DO level) were observed at canal release points (e.g., YANKEECR, HANSENR), but not at stream sites. Aluminum, barium, and copper levels increased slightly at stream sites (MINERSRV5 and BCTRB1). These effects may indicate the transport of fine sediments and potential mobilization of constituents bound to sediments into receiving waters of the United States. As with yearly PG&E outages, PCWA activities during canal cleaning activities are subject to the provisions under the CWA, but they are not required to be permitted.

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PCWA weed and brush control practices may have minimal to no water quality effects on receiving water tributaries and streams during implementation. Physical removal of vegetation may have minimal effects on TSS and turbidity if the removal of vegetation results in the dislodging or loosening of soil along canal banks and causes loose sediment to be deposited into the canals. Algaecide applications were observed to have minimal effects on pH, which increased slightly at both canal and stream sites (YANKEECR and YHTRIB2). Copper concentrations were observed to increase at YANKEECR, and minimal effects on copper concentrations were observed at YHTRIB2 and SECRETRV3. Minimal to no effects were observed with PCWA's herbicide applications. Temporary decreases in DO levels at ANTSTUBCR and ANTC3B are likely not directly related to herbicide applications. PCWA maintains active status with their General NPDES Permit for Discharges of Aquatic Pesticides, and has an active Aquatic Weed Management Program. As part of this program, PCWA completes an evaluation for each algaecide and herbicide application which includes water quality monitoring and treatment efficacy (PCWA 2003b). PCWA also routinely monitors algaecide and herbicide product releases in an effort to identify suitable algaecides and/or herbicides for applications that may have lesser potential effects on natural resources.

PCWA canal lining/guniting practices were observed to result in temporary moderate effects on the water quality of receiving water tributaries and streams. Increases in temperature, pH, TSS, turbidity, aluminum, zinc, and copper were observed at canal outlets (ANTCR, BOARDMANCR, and BAUGHMANCR) and stream sites (CLVRC6, CLVRC3, and MINERSRV5). Although no water quality permits are required for PCWA canal lining practices, compliance with water quality standards is required. Overall, these effects are temporary and can be prevented or minimized with effective BMPs.

Canal and pipe repair activities may have minimal water quality effects on receiving water tributaries and streams. Potential minimal effects are associated with temporary increases in TSS and turbidity from sediment and/or debris entering the canals as a result of soil disturbance from heavy machinery used for canal or pipe repair. With effective BMP implementation, these temporary effects are not likely to have large or long-term impacts, if any, along drainage or stream sites downstream from repair activities. If a canal or pipe repair activity involves any discharge of dredged or fill material into waters of the United States, a Section 404 permit is required with the USACE. Obtaining a Section 404 permit also requires a Section 401 water quality certification with the RWQCB ensuring that any discharge will not violate State water quality standards. Under Section 402 of the CWA, a canal or pipe repair project may also require a general permit for construction activities and compliance under the Placer County Municipal Stormwater Management Program. Associated regulations are further described under the Porter-Cologne Water Quality Control Act.

6.2.1.2 Endangered Species Act

PCWA canal cleaning activities potentially have minimal effects on special status species. Flushing activities after canal cleaning may cause increased TSS and other constituents, and result in minimal effects on special status species, including slight decreases in the extent of

wetland habitats for special status species. Special status species habitat could be damaged by heavy equipment use or by placement of debris and soil near canals and nesting raptors in the vicinity could be disturbed by equipment noise. Under the Federal ESA, regulated by USFWS and NMFS, habitat modification or degradation could be considered a “take” of federally listed species. In which case, an incidental take permit, under Section 10 of the Federal ESA, or a federal interagency consultation, under Section 7 of the Federal ESA, is required.

Potential effects of weed and brush removal activities may require an incidental “take” permit under the Federal ESA if there is a potential for federally listed as endangered or threatened species to be affected. Physical removal of vegetation would result in direct loss of vegetation and habitat. Physical removal of vegetation often require mechanical harvesters, weed rollers, rotovators, and dredging equipment that dislodge contaminated sediments and may affect special status species, such as fish and amphibians (PCWA 2003b). However, this equipment is only used if necessary, and with precautions. Effective BMPs can be implemented to minimize the effects of physical removal of vegetation that would prevent or minimize effects on special status species. Algaecide applications may have minimal effects on special status species, particularly fish and amphibians, from potential toxicity of copper associated with the algaecide. Only slight increases in copper concentrations were observed in receiving streams during monitoring for algaecide application events. Copper concentrations likely associated with algaecide applications were observed to increase during other canal maintenance activities, and are discussed in **Chapter 7**. Herbicide applications may have minimal effects on special status terrestrial species and vegetation along PCWA reservoirs or canal banks from direct exposure to the herbicide.

PCWA canal lining/guniting practices potentially have minimal effects on special status species. Measured pH values in portions of the canal downstream from canal lining activities were high for a short time after flows were restored to the canal system. High pH values can be toxic to federally listed as endangered or threatened fish and other aquatic species.

PCWA canal and pipe repair activities may have variable effects on special status species. Heavy equipment may disturb vegetation along canal banks from access routes and increased noise levels. Construction work along canal banks could cause increased TSS and other constituents in receiving water tributaries and streams, which could affect special status species, particularly fish and amphibians, and the extent of wetland habitats for special status species. Project-specific environmental resources analyses should be performed to assess the potential effects of canal and pipe repair activities on special status species and to determine measures to minimize potential negative effects.

6.2.1.3 Magnuson-Stevens Fishery Conservation and Management Act and the 1996 Sustainable Fisheries Act

PCWA canal cleaning activities may have minimal effects on suitable fishery habitat. As described previously, measures recommended to protect EFH by NMFS are advisory, not prescriptive.

PCWA weed and brush control practices, particularly algaecide application practices, may have minimal effects on fishery resources with respect to potential copper contributions in waters of the United States. Although copper concentrations did not exceed water quality objectives in receiving water tributaries, it was observed to temporarily increase at canal outlets. The toxicity of copper to fish varies with the species and the physical and chemical characteristics of the water. Its toxicity to fish generally decreases as water hardness increases. Fish eggs are more resistant than young fish fry to the toxic effects of copper (Gangstad 1986). Because PCWA applies algaecides and herbicides consistent with NPDES permit requirements, and implements BMPs and other actions specified in a detailed PCWA Algaecide Application Program, these effects are likely reduced.

PCWA canal lining/guniting practices may have minimal effects on suitable fishery habitat. Several constituents, such as pH, turbidity, TSS, SC, and other ions temporarily increased at canal outlets, but minimal to no effects were observed in receiving water tributaries and streams. However, these effects are easily avoidable with effective BMP implementation.

PCWA canal and pipe repair activities may have minimal effects on fishery habitat. Potential sediment loading from construction activities can increase turbidity and limit the ability for fish to hide from predators. Hazardous waste runoff from construction sites can have toxic effects on fish. However, these effects are easily avoidable with effective BMP implementation. Project-specific environmental resources analyses should be performed to assess the potential effects of canal and pipe repair activities on EFH and to determine measures to minimize potential negative effects.

6.2.1.4 Migratory Bird Treaty Act

PCWA canal cleaning activities, weed and brush control practices, and canal lining/guniting practices potentially have minimal effects on migratory bird species from the use of equipment and machinery. However, it is unlikely that these effects would constitute a “take” of a migratory bird species or habitat (as defined by the MBTA) and therefore would not be subject to the MBTA.

PCWA canal and pipe repair activities may have minimal effects on migratory bird species. Noise disturbance and improper equipment staging can cause birds to abandon their nests or resting sites, and the removal of trees that provide habitat for migratory birds can reduce their populations in the vicinity of the construction site. However, with effective BMP implementation, these effects can be dramatically reduced or eliminated.

6.2.2 State Regulations

Laws and regulations governed by the State of California and associated with the potential effects of PCWA maintenance activities are described below.

6.2.2.1 California Environmental Quality Act

PCWA maintenance activities may be considered projects requiring CEQA review if there is potential for resulting in direct change in the environment, or a reasonably foreseeable indirect change in the environment. Some PCWA maintenance activities may be exempt from CEQA. Relevant exemptions include emergency projects (Section 15269), statutory exemptions described in State of California CEQA Guidelines Section 15282, and Class 1 and Class 2 categorical exemptions described in Sections 15301 and 15302. Each PCWA maintenance activity or project should be given a preliminary review to determine whether CEQA applies and whether the project may be eligible for an exemption from CEQA. If an exemption is not applicable, an initial study must be prepared to determine if the project may have a significant effect on the environment. The purposes of an initial study are to:

- (1) Provide the lead agency with information to use as a basis of deciding whether to prepare an EIR or negative declaration.
- (2) Enable an applicant or lead agency to modify a project, mitigating adverse impacts before an EIR is prepared, thereby enabling the project to qualify for a negative declaration.
- (3) Assist the preparation of the EIR on the effects determined to be significant.
 - A. Focusing the EIR on the effects determined to be significant.
 - B. Identifying the effects determined not to be significant.
 - C. Explaining the reasons for determining that potentially significant effects would not be significant.
 - D. Identifying whether a program EIR, tiering, or another appropriate process can be used for analysis of the project's environmental effects (Section 15063.c).

An initial study prepared by PCWA for maintenance activities or projects should include, in brief form, the following:

- (1) A description of the project including the location of the project.
- (2) An identification of the environmental setting.
- (3) An identification of environmental effects by use of a checklist, matrix, or other method, provided that entries on a checklist or other form are briefly explained to indicate that there is some evidence to support the entries. The brief explanation may be either through a narrative or a reference to another information source such as an attached map, photographs, or an earlier EIR or negative declaration. A reference to

another document should include, where appropriate, a citation to the page or pages where the information is found.

- (4) A discussion of the ways to mitigate the significant effects identified, if any.
- (5) An examination of whether the project would be consistent with existing zoning, plans, and other applicable land-use controls.
- (6) The name of the person or persons who prepared or participated in the Initial Study (Section 15063.d).

A Negative Declaration or Mitigated Negative Declaration must be prepared by PCWA for maintenance activities or projects subject to CEQA when (1) the initial study shows that there is no substantial evidence that the project may have a significant effect on the environment; or, (2) the initial study identifies potentially significant effects, but:

- (1) Revisions in the project plans or proposals (i.e., BMPs) made by, or agreed to by the applicant before a proposed mitigated negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur.
- (2) There is no substantial evidence, in light of the whole record before the agency, that the project as revised may have a significant effect on the environment (Section 15070).

A Negative Declaration prepared by PCWA and circulated for public review should include:

- (a) A brief description of the project, including a commonly used name for the project, if any.
- (b) The location of the project, preferably shown on a map, and the name of the project proponent.
- (c) A proposed finding that the project will not have a significant effect on the environment.
- (d) An attached copy of the Initial Study documenting reasons to support the finding.
- (e) Mitigation measures, if any, included in the project to avoid potentially significant effects (Section 15071).

As described in **Chapter 4**, if an Initial Study concludes that a PCWA activity or project is determined to have significant effects on the environment, and EIR must be prepared. The EIR for the activity or project should evaluate the potential significant effects on environmental resources, identify a range of feasible alternatives to the project that would avoid or reduce its impacts, and identify mitigation measures that would minimize or avoid those impacts.

6.2.2.2 Porter-Cologne Water Quality Control Act

As described previously in **Chapter 4**, the CWA defines Water Quality Standards as provisions of State or Federal law, which consist of U.S. EPA and California water quality criteria and water quality objectives for designated beneficial uses for the waters of the United States.

The regulatory framework and effects for PCWA canal cleaning activities are similar to those described previously under the CWA. PCWA canal cleaning activities were found to be in compliance with State water quality standards and objectives regulated by the Central Valley RWQCB. Of the Criteria for Priority Toxic Pollutants in the State of California, cadmium, copper, and zinc were three criteria parameters monitored for during PCWA canal cleaning activities. Cadmium levels were not exceeded. The freshwater CMCs for zinc (120 µg/L) and copper (9 µg/L) were exceeded at some canal release sites monitored during the canal cleaning activities, but no exceedances were observed within receiving water tributaries or streams within the Secret Ravine and Miners Ravine watersheds. Therefore, PCWA canal cleaning activities were observed to be in compliance with state water quality standards. However, if an exceedance did occur within receiving waters of the United States, they are temporary and can be prevented and/or minimized through effective BMP implementation. Of the water quality objectives associated with beneficial uses of the Sacramento River in the Sacramento-San Joaquin Basin Plan, barium, copper, iron, zinc, DO, pH, and turbidity were monitored during PCWA canal cleaning activities. The basin plan water quality objectives for trace elements barium, copper, and zinc were exceeded at canal release points during cleaning events, but no exceedances were recorded in receiving water tributaries and streams within the Secret Ravine and Miners Ravine watersheds. Therefore, PCWA canal cleaning activities were observed to be in compliance with basin plan trace element water quality objectives for the Sacramento River. Basin plan water quality objectives for basic parameters were observed to be slightly exceeded in receiving water tributaries and streams. The DO level in the FRGTRIB1 (6.1 mg/L) was observed to be slightly below the minimum DO level for waters with designated coldwater fishery beneficial uses (7.0 mg/L) during the March 27, 2007, cleaning event. Some pH and turbidity levels at canal release points were observed to exceed the water quality objectives, but none was observed within receiving water tributaries or streams during canal cleaning events. Due to the DO decrease being so slight and temporary, it is not a large concern that PCWA can meet water quality objectives for basic parameters during canal cleaning events.

The regulatory framework for PCWA weed and brush control practices is similar to the framework described previously under the CWA. Of all water quality standards and objectives, the basin plan water quality objective for turbidity has the most potential for exceeding the limit during the physical removal of vegetation. However, increases in turbidity and suspended sediments can easily be avoided or minimized through effective BMP implementation. As described in **Chapter 4**, an NPDES permit is now required under the CWA for aquatic pesticide applications. NPDES permits for discharges to surface waters must meet the most protective (lowest) and appropriate limits in order to protect all designated beneficial uses of the receiving water, which constitute state water quality criteria and Central Valley RWQCB basin plan water quality objectives. PCWA's algacide applications currently comply with NPDES permit requirements. Although copper levels temporarily increased at canal outlets, they remained well below water quality standards and objectives for copper during monitoring for algacide application events. Herbicide applications were also found to be in compliance with state water quality standards and objectives regulated by the Central Valley RWQCB.

The regulatory framework and effects for PCWA canal lining/guniting practices are similar to those described previously under the CWA. No water quality standards were observed to be exceeded in waters of the United States during canal lining activities. DO concentrations were lower than the minimum level water quality objective at canal outlets, but not at tributary or stream sites. Recorded pH levels reached 11.7 at canal sites downstream from lining activities and canal outlets, but the basin plan water quality objective range for pH (6.5 to 8.5) was not exceeded at tributary or stream sites. Turbidity levels exceeded the basin plan water quality objective (increase by greater than 20 percent) in Miners and Secret ravines, but remained below 100 NTUs. Barium, iron, zinc, and copper levels were increased at canal sites downstream from the lining activity and at canal outlets, but they did not exceed water quality objectives in receiving water tributaries and streams. Turbidity was the only parameter observed to exceed water quality objective levels during canal lining activities, and may be controlled by effective BMP implementation.

The regulatory framework and effects for PCWA canal and pipe repair activities are similar to those described for the CWA. If a Section 401 certification is required, an application should be prepared and submitted for approval before project implementation. Increases in turbidity in receiving water tributaries and streams are of primary concern during these activities, and increases in turbidity and suspended sediments can easily be avoided or minimized through effective BMP implementation. The Placer County Stormwater Management Program (required under the RWQCB Phase II MS4 permit) provides guidance on the implementation of BMPs that minimize the potential effects of construction activities. A pipe repair project that results in the disturbance of greater than 1 acre of land requires a General Construction General Permit with the RWQCB. Under Construction General Permit requirements, a SWPPP is required to be prepared, be on site at all times, and be followed by a designated construction contractor to ensure that contaminants are not discharged into the river. Water quality monitoring and observation reports at construction sites is required during at least two precipitation events, the first one being the first-flush rain event. Monitoring results and other information are to be submitted in annual reports each June to the RWQCB for compliance review. Monitoring results are compared to nonenforceable EPA Parameter Benchmark Levels (see **Chapter 3**) that, if exceeded, a warning letter is sent to the permittee advising implementation of more effective BMPs to minimize waste discharges.

6.2.2.3 California Endangered Species Act

Under the California ESA, the effects on special status species from PCWA maintenance activities during PCWA canal cleaning activities, PCWA weed and brush control practices, canal lining/guniting practices, and canal and pipe repair activities are similar to those described previously under the Federal ESA. However, the California ESA addresses the incidental take of State-listed species as threatened or endangered.

6.2.2.4 California Fish and Game Code-Fully Protected Species

Under the Fish and Game Code-Fully Protected Species, the effects on special status species from PCWA canal cleaning activities, PCWA weed and brush control practices, canal

lining/guniting practices, and canal and pipe repair activities, are similar to those described previously under the Federal ESA. However, this code addresses the incidental take of fully protected species. DFG is unable to authorize incidental take of fully protected species, such as White-tailed Kite and the California Black Rail, when activities are proposed in areas inhabited by those species. Therefore, the take of any fully protected species for project implementation is prohibited.

6.2.2.5 California Fish and Game Code Section 1602 – Lake and Streambed Alteration Program

In accordance with the Lake and Streambed Alteration Program, PCWA is required to notify DFG of any proposed activity that may substantially modify study area streams or lakes. Potential PCWA maintenance activities that may require notification include actions that will substantially divert or obstruct the natural flow of any river, stream, or lake; substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake; or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. If PCWA canal repair or pipe repair activities have the potential to modify streams or lakes as described above, PCWA should provide notification to DFG under the Lake and Streambed Alteration Program.

6.2.2.6 California Native Plant Protection Act

This act applies to endangered and “rare” plant species, subspecies, and varieties of wild native plants in California. PCWA canal cleaning, weed and brush control, canal lining/guniting, and canal and pipe repair activities may affect endangered and “rare” plant species during the use of equipment and machinery in canals and along canal banks. PCWA weed and brush control practices may also have moderate effects on endangered and “rare” plant species. Physical removal of vegetation could result in direct loss of vegetation and habitat. Herbicide applications near special endangered and “rare” plant species may expose it to the toxic effects of herbicides. However, with proper application and effective BMP implementation, these effects can be prevented or minimized.

6.2.3 Local Requirements and Considerations

The following sections describe the framework for local requirements during PCWA maintenance activities.

6.2.3.1 Placer County Conservation Plan

As described in **Chapter 4**, the PCCP includes plans with goals to protect fish and wildlife and their habitat and protect streams, wetlands and other water resources, as well as coverage under several environmental permits to be issued to Participating Entities. With PCCP long-term environmental permits described in **Chapter 4**, PCWA will be covered for activities projects that require it.

The regulatory framework for PCWA maintenance activities related to the PCCP are the same as the those described for CWA, ESA, Porter-Cologne Water Quality Control Act, California ESA, California Fish and Game Code-Fully Protected Species, and Lake and Streambed Alteration Program.

6.2.3.2 Placer County Stormwater Management Plan

PCWA construction activities during canal and pipe repair projects may be subject to Construction Site Stormwater Runoff Control guidelines the Placer County SWMP. Projects within Placer County will be designed using BMPs for stormwater discharges. The SWMP provides guidance in establishing BMPs before, during, and after construction activities, as well as long-term maintenance BMPs.

Placer County has established procedures specified in the county Grading and Erosion Prevention Ordinance for applying and enforcing construction site pollution control measures, including site plan reviews, requiring erosion and sediment control BMPs, inspections, and enforcement of violations.

6.2.3.3 Placer County Code, Tree Preservation Ordinance

Lining of previously unlined section of PCWA's canal system may indirectly affect adjacent trees historically supported by canal seepage. Also, PCWA canal and pipe repair activities may require the removal of trees. Placer County's tree ordinance sets county-wide requirements for projects within riparian zones, permit requirements for removal of landmark trees, removal of more than 50 percent of trees, and commercial firewood cutting, and establishes tree preservation zones. For example, the removal of more than 50 percent of existing native trees (equal to or greater than 6 inches in diameter at breast height), and of any landmark tree, is subject to the issuance of a tree permit. A "landmark tree" means a tree or grove of trees designated by resolution of the board of supervisors to be of historical or cultural value, an outstanding specimen, an unusual species and/or of significant community benefit (i.e., palms, along English Colony Road, oak canopy tree areas, Deodar cedars on Highway 49, major heritage oak trees). Tree preservation zone provisions are applicable to the Dry Creek-West Placer Community Plan, Granite Bay Community Plan, portions of the Loomis Basin General Plan, and the Auburn-Bowman Community Plan. A tree preservation zone map is available in the Placer County Planning Office for more details on zoning areas

6.2.3.4 Placer County Oak Woodland Management Plan

As described above, PCWA's canal lining, canal repair, and pipe repair activities may affect trees, including oaks, adjacent to canals. The regulatory framework related to the Placer County Oak Woodland Management Plan for canal lining, and canal and pipe repair activities are similar to those described in the Placer County Tree Preservation Ordinance. As part of this plan, projects are subject CEQA assessments for oak woodland habitats.