Draft Environmental Impact Report
Lake Gregory Dam Rehabilitation Project

Prepared for
San Bernardino County
Special Districts Department

Technical Support Provided by
Aspen Environmental Group

November 2015
Lake Gregory Dam Rehabilitation Project
Environmental Impact Report

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Executive Summary

This Draft Environmental Impact Report (EIR) has been prepared to address the environmental effects associated with implementation of the proposed Lake Gregory Dam Rehabilitation Project (proposed Project). The County of San Bernardino Special Districts Department (County) proposes to construct the Project in order to rectify structural inadequacies in the dam, to mitigate safety concerns from damage to the dam and associated flooding that could result from a large earthquake in the area.

The County, as the Lead Agency under the California Environmental Quality Act (CEQA), has prepared this EIR for the proposed Project. This EIR is an informational document for the general public and governmental agencies to review and evaluate the proposed Project. The reader should not rely exclusively on the Executive Summary as the sole basis for judgment of the proposed Project and alternatives; rather, the complete EIR should be consulted for specific information about the environmental effects and the implementation of associated mitigation measures.

Responsible and Trustee Agencies, other agencies with review authority over the proposed Project, and agencies with which the County would need to coordinate aspects of the proposed Project include the following:

- California Department of Water Resources, Division of Safety of Dams (DSOD; review and acceptance of the dam rehabilitation)
- California Department of Conservation, Office of Mine Reclamation (review and acceptance of the proposed borrow sites)
- State Water Resources Control Board and Lahontan Regional Water Quality Control Board (review and enforcement over stormwater discharges and authority over any other water or waste discharges)
- California Department of Fish and Wildlife (review and agreement for any streambed alteration or incidental take authorization that may be required)
- California Department of Transportation (review and authority over any Project-related activity within a state-owned transportation Right-of-Way [ROW])
- California Highway Patrol (coordinating regarding haul route traffic on state highways)
- U.S. Army Corps of Engineers (review of construction-related emissions)
- San Bernardino County Department of Public Works (review and authority over any Project-related activity within a County-owned transportation ROW)
- San Bernardino County Land Use Services Department (issue and enforce Mining CUP and Reclamation Plan for proposed borrow sites)
- San Bernardino County Fire Department (review and authority over any Project-related activity within a County-owned transportation ROW or within a Fire Safety Overlay)
- San Bernardino County Sheriff’s Department (review and authority over any Project-related activity with a County-owned transportation ROW)
- San Bernardino County Solid Waste Management Division (permit authority over Project-related waste disposal)
ES.1 Summary of Proposed Project

ES.1.1 Background

Lake Gregory Regional Park, originally a privately built and owned recreational facility, has been in operation since the completion of the dam on October 26, 1938. The San Bernardino County Regional Parks Department took ownership of the dam, lake, the water in the lake, and the park on November 7, 1977 from the Crest Forest County Water District and now operates the Lake Gregory Regional Park (Park) as a public facility. Within the Park, the lake is operated for public recreation (primarily as a boating and fishery resource). Lake Gregory is located in the San Bernardino Mountains approximately 14 miles north of the City of San Bernardino in the community of Crestline. The lake is accessible via Lake Drive from Highway 138 to Crestline.

Lake Gregory has a current surface area of approximately 81 acres, a current maximum depth of approximately 60 feet at its ordinary high water mark, and spillway elevation of 4,517 feet above mean sea level. The capacity varies seasonally and on average is 2,100 acre-feet. Outflow from Lake Gregory is normally conveyed via Houston Creek, which drains to Silverwood Lake. The DSOD has placed the lake under restricted use due to insufficient capacity of the outlet works and unresolved issues regarding dam stability during a seismic event. The dam does not meet the minimum factor of safety requirements for pseudostatic seismic loading and post-earthquake stability and the low level drain does not meet DSOD’s requirements for evacuating the lake in an emergency. The proposed Project addresses only the safety concerns with the dam; the outlet works are being addressed as a different project under separate environmental review.

A major earthquake, most likely triggered along the San Andreas Fault, could shake the Lake Gregory Dam strongly enough to cause liquefaction in a 30-foot-high horizontal section of the dam beginning 25 feet from the dam crest, possibly causing dam failure and downstream flooding. This section of the dam was found to have been improperly compacted during construction. The areas above and below this low-density section were properly compacted during construction, and safety concerns are therefore focused only on this section of the dam. The County has been engaged in ongoing coordination with DSOD since the mid-1980s, to precisely define the dam’s safety concerns and to develop strategies to mitigate the concerns and achieve DSOD safety standards throughout the entire dam.

ES.1.2 Proposed Project

The proposed Project is shown on Figure ES-1 (Project Location) and is described in detail in Section 2 (Project Description). The proposed Project consists of constructing an earthen stabilization buttress on the downstream (dry side) slope of the existing Lake Gregory Dam. The Project would include the removal of trees and vegetation from the downstream slope of the dam, the removal of the existing rock on the downstream slope, removal of foundation material at the base of the dam, the addition of a new 40-foot average thickness earthen buttress extending approximately 62 feet beyond the current toe of the embankment, installation of a drainage system to pick up water moving through the liquefaction zone, and placement of new slope protection. Construction of the proposed Project would also require retrieval and hauling of stockpiled material; a temporary bridge reinforcement over Houston Creek in privately owned Camp Switzerland; traffic controls along Lake Drive, including a temporary road detour; temporary or permanent relocation of utilities on Lake Drive; restoration of disturbed areas; and road repairs along the haul routes and affected portion of Lake Drive.
EXECUTIVE SUMMARY

Figure ES-1
Project Location
Depending on soil composition and quantity required (as determined during final engineering), the Project may require excavation and hauling of material from up to two borrow sites near the dam. Imported material may also need to be obtained from quarries in the San Bernardino valley.

The proposed Project has been reviewed by DSOD and determined to be a feasible option to stabilize Lake Gregory Dam.

The buttress would require up to 70,000 cubic yards of earthen material. Source material would come from dredged material from the Lake Gregory Swim Beach Silt Management Project, currently stockpiled at Thousand Pines Christian Camp in Crestline, imported material from up to two quarries near San Bernardino (as needed), and from up to two borrow sites on Thousand Pines Christian Camp property. The stockpile location is approximately two miles from the dam, the borrow sites are approximately 1.6 miles from the dam, and the proposed Project would require haul trucks to move the material on existing roads from the Thousand Pines Christian Camp to the dam. Additional material would be obtained from Lake Arrowhead dredging material currently stockpiled at the County’s Papoose Lake Dam in Lake Arrowhead, approximately 10 miles from the proposed Project site. The San Bernardino are quarries are approximately 16 miles from the Project site.

ES.2 Environmental Review Process

The County prepared and transmitted a Notice of Preparation (NOP) for this EIR on September 20, 2013. Comments on the NOP were requested by no later than October 21, 2013. Scoping comments were received from trustee and responsible agencies, as well as private citizens. The NOP and scoping letters are included as Appendix 1 of this EIR.

This Draft EIR is being released for agency and public review for the period between November 10, 2015 and January 5, 2016. After completion of the public review period, all comments received on the Draft EIR will be reviewed and written responses will be prepared, along with any necessary revisions to the Draft EIR for the purposes of its finalization. The County’s Board of Supervisors will then consider approval of the Project at a noticed public hearing after completion of the Final EIR and certification of the EIR.

ES.3 Summary of Impacts and Mitigation Measures

Section 3 of this EIR presents the direct and indirect impacts associated with the proposed Project, and Section 5 provides its incremental contribution to cumulative effects. Implementation of the proposed Project would result in two significant and unavoidable impacts for air quality and recreation. The proposed Project would result in several adverse impacts that can be mitigated to a level of less than significant. These impacts would be related to aesthetics, air quality, biological resources, cultural and paleontological resources, hazards, hydrology and water quality, noise, utilities, and traffic and transportation, as summarized in Table ES-1 (located at the end of this section). All other impacts associated with the proposed Project’s implementation would be less than significant or beneficial.

The proposed Project would contribute substantially to cumulative air quality impacts during the temporary construction phase. In addition, while the County seeks to avoid lowering the lake level, if DSOD determines that lowering the level is required to maintain safety of the dam during construction, recreational activities at the swim beach would be significantly affected.
ES.4 Summary of Alternatives Analysis

Section 4 (Alternatives) provides a description of the Project alternatives. The nature of the proposed Project (rehabilitation of an existing dam) make location alternatives infeasible, so only alternative technologies for dam reinforcement have been assessed. The No Project Alternative is also evaluated, as required under §15126.6 (e) of the California Code of Regulations. The alternatives analysis includes a discussion of alternatives that were dismissed from further consideration, as well as a comparative analysis of a reasonable range of potentially feasible Project alternatives.

The alternatives in the comparative analysis include the following:

**Alternative 1 – Proposed Project**

Summarized in ES.1.2, described in Section 2 (Project Description), and analyzed in Section 3 (Environmental Setting, Analysis, and Mitigation Measures).

**Alternative 2 – Cement Deep Soil Mixing**

The Cement Deep Soil Mixing (CDSM) alternative would consist of injecting the CDSM to form columns in a grid pattern on the downstream side in a 40-foot wide band all the way across the existing dam embankment. This method would provide stiffness in the low density zone, reducing liquefaction potential. This alternative would not require hauling earthen material from stockpile and quarry locations, and would avoid the associated traffic and air quality impacts. It would also avoid the need for the two borrow sites and the associated traffic and environmental impacts at the Ponderosa Camp. However, because this alternative does not address upstream seismic instability, additional reinforcements such as a buttress on the downstream slope would likely be required but are unknown at this time without detailed engineering investigation.

**Alternative 3 – Stone Column Strengthening**

Stone columns would be constructed in a series of three rows on the downstream side, all the way across the embankment. This installation would provide stiffness in the low density zone, reducing liquefaction potential. This alternative would not require hauling earthen material from stockpile and quarry locations, and would avoid the associated air quality and traffic impacts. It would also avoid the need for the two borrow sites and the associated traffic and environmental impacts at the Ponderosa Camp. However, because this alternative does not address upstream seismic instability, additional reinforcements such as a buttress on the downstream slope would likely be required but are unknown at this time without detailed engineering investigation.

**Alternative 4 – Upstream Asphalt Facing**

An asphalt slope would be constructed to overlay the upstream slope of the dam. This would provide a firm, semi-permeable face to the dam. Lake Gregory would have to be completely dewatered to construct this alternative. Because the lake is dependent on precipitation and storm runoff and there are no artificial water sources to refill the lake, this alternative would result in significant and unavoidable impacts to aesthetics, recreation, and fisheries. However, this alternative would not require hauling earthen material from stockpile locations, and would avoid the associated traffic impacts. It would also avoid the need for the two borrow sites and the associated traffic and environmental impacts at the Ponderosa Camp.
No Project Alternative

Under this alternative, the proposed Project would not be constructed. However, the dam would remain out of compliance with DSOD safety standards and would continue to present a potential hazard of dam failure and associated downstream flooding in the event of a major earthquake. Further, additional restrictions such as substantially lowering the lake level may be required to minimize pressure on the dam. These restrictions could affect existing uses at Lake Gregory.

Environmentally Superior Alternative

Based on the analysis contained in Sections 3 (Environmental Setting, Analysis, and Mitigation Measures) and 4 (Alternatives) of this EIR, the proposed Project (Alternative 1) is the environmentally superior alternative. Alternative 4 (Upstream Asphalt Facing) would introduce new impacts and would substantially increase the magnitude of several impacts as compared to Alternative 1. Alternative 3 (Stone Column Strengthening) and Alternative 2 (Cement Deep Soil Mixing) would avoid impacts at the borrow sites and would therefore reduce the magnitude of impacts for several issue areas including traffic and transportation, air quality and greenhouse gas emissions, biological resources, and others. However, both of these alternatives involve boring into the dam structure during installation of the reinforcements, which could undermine the stability of the dam and increase risk of failure during the construction period. The proposed Project would not affect the structural integrity of the existing dam during construction and would instead strengthen it by constructing a buttress on the downstream face of the existing dam. Consequently, the dam would remain stable throughout construction and would minimize risk of seismically-induced failure once the buttress is complete. In addition, Alternatives 2 and 3 do not address upstream seismic instability in the existing dam, and if one of these alternatives is selected, a downstream buttress may be required which would have similar environmental impacts to the proposed Project. Therefore, the maintenance of structural integrity for the existing dam during construction under Alternative 1 (Proposed Project) would outweigh the reduction in magnitude of several environmental effects from Alternatives 2 and 3 (Cement Deep Soil Mixing and Stone Column Strengthening, respectively), and Alternative 1 is therefore the environmentally superior alternative.

ES.5 Areas of Controversy and Issues to be Resolved

Evaluation of the proposed Project under CEQA was initiated on September 20, 2013. As of the publication of this Draft EIR, no areas of controversy or issues in need of resolution have been communicated to the San Bernardino County Special Districts Department. Additionally, there are no remaining technical project description issues or environmental review issues left to be resolved.
<table>
<thead>
<tr>
<th>Issue Area</th>
<th>Impact Number</th>
<th>Impact Summary</th>
<th>Mitigation Measure(s)</th>
<th>Level of Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aesthetics</td>
<td>AES-1</td>
<td>The Project could have adverse effects on scenic vistas</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td></td>
<td>AES-2</td>
<td>The Project could have adverse effects on visual character of the site and surroundings</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td></td>
<td>AES-3</td>
<td>The Project would maintain consistency with visual resource goals and policies</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td></td>
<td>AES-4</td>
<td>The Project could create new sources of light and/or glare</td>
<td>• MM AES-1: Minimize Lighting Impacts</td>
<td>Less than Significant with Mitigation</td>
</tr>
<tr>
<td>Air Quality</td>
<td>AQ-1</td>
<td>The Project could conflict with or obstruct implementation of the applicable air quality plan</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td></td>
<td>AQ-2</td>
<td>The Project could violate any air quality standard or contribute substantially to an existing or projected air quality violation</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
</tbody>
</table>
|                   | AQ-3          | The Project would result in cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) | • MM AQ-1: Fugitive Dust Control  
• MM AQ-2: Off-road Equipment Emissions Control  
• MM AQ-3: On-road Equipment Emissions Control | Significant and Unavoidable                           |
|                   | AQ-4          | The Project could expose sensitive receptors to substantial pollutant concentrations | • MM AQ-1: Fugitive Dust Control                                  | Less than Significant with Mitigation (Localized Criteria Pollutant Emissions Impacts and Valley Fever Impacts); Less than Significant (TAC Emissions Impacts) |
|                   | AQ-5          | The Project could create objectionable odors affecting a substantial number of people | None required                                                      | Less than Significant                        |
| Greenhouse Gas Emissions | GCC-1      | The Project could produce GHG emissions that exceed the SCAQMD CO2e annualized significance threshold | None required                                                      | Less than Significant                        |
|                   | GCC-2         | The Project could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions | None required                                                      | Less than Significant                        |
### Table ES-1. Summary of Impacts and Mitigation Measures

<table>
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<tr>
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</thead>
<tbody>
<tr>
<td>Biological Resources</td>
<td>BIO-1</td>
<td>The Project would result in the loss or degradation of native vegetation, habitat, and sensitive natural communities and jurisdictional areas</td>
<td>• MM BIO-1: Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas&lt;br&gt;• MM BIO-2: Pre-construction Surveys and Construction Monitoring&lt;br&gt;• MM BIO-3: Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss&lt;br&gt;• MM AQ-1: Fugitive Dust Control&lt;br&gt;• MM HAZ-1: Licensed Herbicide Applicator&lt;br&gt;• MM HAZ-3: Siting of Hazardous Materials</td>
<td>Less than Significant with Mitigation</td>
</tr>
<tr>
<td></td>
<td>BIO-2</td>
<td>The Project would adversely affect plants and wildlife, including candidate, sensitive, or special-status species</td>
<td>• MM BIO-1: Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas&lt;br&gt;• MM BIO-2: Pre-construction Surveys and Construction Monitoring&lt;br&gt;• MM BIO-3: Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss&lt;br&gt;• MM BIO-4: Prevent Invasive Weed Introduction&lt;br&gt;• MM BIO-5: Nest and Den Avoidance&lt;br&gt;• MM BIO-6: Avoid Wildlife Hazards and Entrapment&lt;br&gt;• MM BIO-7: Avoid Nocturnal Wildlife&lt;br&gt;• MM BIO-8: Manage Project Trash&lt;br&gt;• MM BIO-9: Minimization and Avoidance Measures for Southern Rubber Boa&lt;br&gt;• MM AQ-1: Fugitive Dust Control</td>
<td>Less than Significant with Mitigation</td>
</tr>
<tr>
<td></td>
<td>BIO-3</td>
<td>The Project could interfere with wildlife movement</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td></td>
<td>BIO-4</td>
<td>The Project could conflict with local policies or ordinances protecting biological resources</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Cultural Resources</td>
<td>CUL-1</td>
<td>The Project could cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5</td>
<td>• MM CUL-1: Incidental Discovery of Historical Resources or Archaeological Resources</td>
<td>Less than Significant with Mitigation</td>
</tr>
<tr>
<td></td>
<td>CUL-2</td>
<td>The Project could cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5</td>
<td>• MM CUL-1: Incidental Discovery of Historical Resources or Archaeological Resources</td>
<td>Less than Significant with Mitigation</td>
</tr>
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<tr>
<td>CUL</td>
<td>CUL-3</td>
<td>The Project may disturb human remains, including those interred outside of formal cemeteries</td>
<td>• MM CUL-2: Incidental Discovery of Human Remains</td>
<td>Less than Significant with Mitigation</td>
</tr>
<tr>
<td>Paleontological</td>
<td>PALEO-1</td>
<td>The Project would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature</td>
<td>• MM PALEO-1: Incidental Discovery of Paleontological or Geological Resources</td>
<td>Less than Significant with Mitigation</td>
</tr>
<tr>
<td>Geology &amp; Soils</td>
<td>GS-1</td>
<td>Project structures could be damaged by surface fault rupture at crossings of active faults exposing people or structures to hazards</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Geology &amp; Soils</td>
<td>GS-2</td>
<td>Project structures could be damaged by seismically induced ground shaking, landslides, liquefaction, settlement, lateral spreading, and/or surface cracking, exposing people or structures to hazards</td>
<td>None required</td>
<td>Beneficial Impact</td>
</tr>
<tr>
<td>Geology &amp; Soils</td>
<td>GS-3</td>
<td>Erosion could be triggered or accelerated due to construction activities</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Geology &amp; Soils</td>
<td>GS-4</td>
<td>Landslides could be triggered or accelerated due to construction activities</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Geology &amp; Soils</td>
<td>GS-5</td>
<td>Expansive soils or other unstable soils could cause damage to Project components, exposing people or structures to potential risk of loss or injury</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Hazards</td>
<td>HAZ-1</td>
<td>The Project could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials</td>
<td>• MM HAZ-1: Licensed Herbicide Applicator</td>
<td>Less than Significant with Mitigation</td>
</tr>
<tr>
<td>Hazards</td>
<td>HAZ-2</td>
<td>The Project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment</td>
<td>• MM HAZ-2: Response to Contamination</td>
<td>Less than Significant with Mitigation</td>
</tr>
<tr>
<td>Hazards</td>
<td>HAZ-3</td>
<td>The Project could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td>Hazards</td>
<td>HAZ-4</td>
<td>The Project could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan</td>
<td>• MM TR-4: Coordinate with Emergency Service Providers</td>
<td>Less than Significant with Mitigation</td>
</tr>
<tr>
<td>Hazards</td>
<td>HAZ-5</td>
<td>The Project could expose people or structures to a significant risk of loss, injury, or death involving wildland fires</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
</tbody>
</table>
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</table>
| Hydrology & Water Quality         | HW-1          | Construction could violate water quality standards or waste discharge requirements, provide substantial additional sources of polluted runoff, or otherwise substantially degrade or diminish surface water quality, by introducing pollutants to surface waters of Houston Creek or Lake Gregory | • MM HW-1: Develop a Stormwater and Erosion Control Plan  
• MM BIO-1: Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas  
• MM BIO-2: Pre-construction Surveys and Construction Monitoring  
• MM BIO-3: Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss  
• MM BIO-4: Prevent Invasive Weed Introduction  
• MM AQ-1a: Fugitive Dust Control  
• MM HAZ-1: Licensed Herbicide Applicator  
• MM HAZ-3: Siting of Hazardous Materials | Less than Significant with Mitigation                                                                      |
|                                   | HW-2          | The proposed Project could alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site | • MM HW-1: Develop a Stormwater and Erosion Control Plan  
• MM BIO-1: Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas | Less than Significant with Mitigation                                                                      |
<p>|                                   | HW-3          | The proposed Project would create a flood hazard                                                                                                                                                               None required | Beneficial Impact                            |
|                                   | HW-4          | Construction would deplete local groundwater supplies                                                                                                                                                         None required | Less than Significant                        |
| Land Use                          | LU-1          | The Project could conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project, adopted for the purpose of avoiding or mitigating an environmental effect | None required                                                                                                                                                 | Less than Significant                        |
| Noise                             | NOI-1         | The Project could expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies | None required                                                                                                                                                 | Less than Significant                        |
|                                   | NOI-2         | The Project could expose persons to or generate excessive groundborne vibration or groundborne noise levels                                                                                                   None required | Less than Significant                        |
|                                   | NOI-3         | The Project could result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project                                                         None required | Less than Significant                        |
|                                   | NOI-4         | The Project could result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project                                                   • MM NOI-1: Implement Best Management Practices During Construction | Less than Significant with Mitigation                                                                   |</p>
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<tr>
<td><strong>Utilities</strong></td>
<td>U-1</td>
<td>The Project could exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td></td>
<td>U-2</td>
<td>The Project could require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td></td>
<td>U-3</td>
<td>The Project would have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td></td>
<td>U-4</td>
<td>The Project could result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project’s projected demand in addition to the provider’s existing commitments</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td></td>
<td>U-5</td>
<td>The Project would be served by a landfill with sufficient permitted capacity to accommodate the Project’s solid waste disposal needs</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td></td>
<td>U-6</td>
<td>The Project would comply with federal, State, and local statutes and regulations related to solid waste</td>
<td>• MM U-1: Recycle Solid Waste&lt;br&gt;• MM U-2: Designate a Recyclable Materials Storage Area during Construction</td>
<td>Less than Significant with Mitigation</td>
</tr>
<tr>
<td></td>
<td>U-7</td>
<td>The Project could interfere with existing utility systems</td>
<td>• MM U-3: Notify the Public of Utility Service Interruptions</td>
<td>Less than Significant with Mitigation</td>
</tr>
<tr>
<td><strong>Recreation &amp; Fisheries</strong></td>
<td>RF-1</td>
<td>The Project could increase the use of existing neighborhood and regional parks or other recreational facilities such that the physical deterioration of the facility would occur or be accelerated</td>
<td>None required</td>
<td>Less than Significant</td>
</tr>
<tr>
<td></td>
<td>RF-2</td>
<td>The Project could conflict with or preclude permitted recreation activities or interfere with fishing activities</td>
<td>• MM AES-1: Minimize Lighting Impacts&lt;br&gt;• MM AQ-1: Fugitive Dust Control&lt;br&gt;• MM NOI-1: Implement Best Management Practices During Construction&lt;br&gt;• MM TR-1: Construction Traffic Management Plan&lt;br&gt;• MM TR-2: Traffic Control Plan for Lake Drive and Detours&lt;br&gt;• MM TR-3: Notification to Property Owners and Tenants</td>
<td>Less than Significant with Mitigation, or Significant and Unavoidable (if lake must be lowered)</td>
</tr>
</tbody>
</table>
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</thead>
</table>
| Traffic & Transportation | TR-1          | The Project could conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system | • MM TR-1: Construction Traffic Management Plan  
• MM TR-2: Traffic Control Plan for Lake Drive and Detours  
• MM TR-3: Notification to Property Owners and Tenants  
• MM TR-4: Coordinate with Emergency Service Providers  
• MM TR-5: Pavement Rehabilitation                      | Less than Significant with Mitigation                                                          |
|                     | TR-2          | The Project could conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways | None required                                                                      | Less than Significant                  |
|                     | TR-3          | The Project could substantially increase hazards due to a design feature or incompatible uses          | • MM TR-1: Construction Traffic Management Plan  
• MM TR-2: Traffic Control Plan for Lake Drive and Detours  
• MM TR-3: Notification to Property Owners and Tenants  
• MM TR-4: Coordinate with Emergency Service Providers  
• MM TR-5: Pavement Rehabilitation                      | Less than Significant with Mitigation                                                          |
|                     | TR-4          | The Project could result in inadequate emergency access                                                | • MM TR-1: Construction Traffic Management Plan  
• MM TR-2: Traffic Control Plan for Lake Drive and Detours  
• MM TR-3: Notification to Property Owners and Tenants  
• MM TR-4: Coordinate with Emergency Service Providers | Less than Significant with Mitigation                                                          |
|                     | TR-5          | The Project could conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities | • MM TR-2: Traffic Control Plan for Lake Drive and Detours  
• MM TR-6: Coordinate with Mountain Transit and School Districts | Less than Significant with Mitigation                                                          |
1. Introduction

1.1 Purpose and Intended Uses of the EIR

The County of San Bernardino Special Districts Department (County), as administrator and manager of the Lake Gregory Dam Rehabilitation Project (proposed Project), proposes to fortify the existing dam by expanding the buttress on the downstream side. Improvements are necessary to increase the lake’s holding capacity under seismic events that could compromise the dam structure. The proposed Project would consist of physical improvements that include the placement of layered fill material on the downstream side of the existing Lake Gregory Dam, excavation of earthen material from up to two borrow sites, earthen material hauling and processing, relocation of utilities on Lake Drive, and interim traffic detour routes.

This Environmental Impact Report (EIR) has been prepared pursuant to the requirements of the California Environmental Quality Act (CEQA). The County is the lead agency under CEQA. CEQA requires the lead agency to consider the information contained in an environmental review document, in this case an EIR, prior to taking any discretionary action. This EIR will serve as an informational document to be considered by the County and other local and state permitting agencies during their respective processing of the proposed Project.

This EIR evaluates and identifies recommended mitigation measures to offset direct, indirect, and cumulative impacts associated with the proposed Project’s implementation. This EIR also identifies and evaluates the impacts of alternatives to the proposed Project, discloses growth-inducing impacts, and identifies its significant and unavoidable effects and significant irreversible environmental changes.

1.2 Historical Background

Lake Gregory is a man-made lake located in the San Bernardino Mountains in the community of Crestline, approximately 14 miles north of the City of San Bernardino. The Lake Gregory Dam was completed in 1938 and the lake has been owned and operated as a public facility by the San Bernardino County Regional Parks Department since 1977. In 1986, the California Department of Water Resources, Division of Safety of Dams (DSOD) identified concerns about the seismic stability of the earthen dam. Subsequent analyses and investigations confirmed that a 30-foot-high horizontal section of the dam beginning 25 feet from the top could experience liquefaction during a major earthquake due to improper compaction of materials. Liquefaction of this section during seismic shaking could cause failure of the dam. The DSOD has restricted Lake Gregory’s lake level until capacity of the outlet works and pending issues regarding dam stability during an earthquake are resolved. The proposed Project addresses only the seismic stability of the dam, and the outlet improvements are being conducted separately from the proposed Project.

The County reviewed multiple engineering alternatives to stabilize the dam, and concluded that construction of a buttress on the downstream side of the dam to stabilize it and ensure structural integrity is the most viable and cost-effective solution. The DSOD has determined this alternative to be feasible.

The County prepared a Notice of Preparation (NOP) for the Project on September 20, 2013, which identified that preparation of an EIR would be required as part of the permitting process (see Appendix 1). In compliance with CEQA guidelines, the County solicited public and agency comments through the distribution of the NOP. Several written comments were received during the 30-day public comment period, and comments received previously on this Project were used to help direct the scope of the analysis in this EIR.
1.3 Project Objective

As presently built, the Lake Gregory Dam does not meet the DSOD’s seismic safety requirements. Concerns about the dam’s stability during a major earthquake focus on a 30-foot-high horizontal section of the dam beginning approximately 25 feet from the top that was poorly compacted when the dam was constructed. From analysis of the dam's construction history and results of geotechnical sampling conducted in 2010, the subject area is inconsistent with the properly constructed and compacted areas above and below this section. The proposed Project is needed to stabilize the Lake Gregory Dam to reduce downstream hazards associated with dam failure in the event of a major earthquake. The objective for the proposed Project is to rectify structural inadequacies in the dam in accordance with DSOD safety standards, to mitigate safety concerns from damage to the dam that could result from a large earthquake in the area.

1.4 Summary of Scoping Comments

The scoping comment period began on September 20, 2013 with the release of the NOP and ended on October 21, 2013. Scoping comments were received from trustee and responsible agencies, as well as private citizens. Table 1-1 (Scoping Comments) provides a summary of the comments received.

<table>
<thead>
<tr>
<th>Commenter</th>
<th>Comment Date</th>
<th>Commenter Type</th>
<th>Comment Summary</th>
<th>Addressed in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>South Coast Air Quality Management District</td>
<td>10/4/2013</td>
<td>Regional Agency</td>
<td>The commenter highlights several areas for analysis in the Draft EIR including the effects on air quality for all Project phases, a comparison of emissions to both regional and localized significance thresholds, and requests that mitigation developed by the commenter be utilized to reduce impacts.</td>
<td>Section 3.3 Air Quality and Greenhouse Gas Emissions</td>
</tr>
<tr>
<td>California Department of Fish and Wildlife</td>
<td>10/21/2013</td>
<td>State Agency</td>
<td>The commenter highlights several areas for analysis in the Draft EIR including biological inventories, surveys, native species, and impacts on significant ecological areas. The commenter includes a discussion of laws and regulations applicable to the proposed Project including a jurisdictional delineation and the Lake and Streambed Alteration Program. The commenter also requests that the Draft EIR include a mitigation plan.</td>
<td>Section 3.4 Biological Resources</td>
</tr>
<tr>
<td>California Department of Water Resources</td>
<td>10/10/2013</td>
<td>State Agency</td>
<td>The commenter expresses concern about the use of dredged reservoir sediments. Commenter also noted that the Division of Safety of Dams has not yet approved any alternatives.</td>
<td>Section 2 Project Description</td>
</tr>
<tr>
<td>Jeff Silva, Camp Switzerland</td>
<td>10/21/2013</td>
<td>Private Citizen</td>
<td>The commenter expresses concerns regarding the removal of trees in the area, the species present, and the impact on local businesses that the removal of the trees would have.</td>
<td>Section 3.4 Biological Resources, Section 3.2 Aesthetics</td>
</tr>
</tbody>
</table>
Table 1-1. Scoping Comments

<table>
<thead>
<tr>
<th>Commenter</th>
<th>Comment Date</th>
<th>Commenter Type</th>
<th>Comment Summary</th>
<th>Addressed in:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lahontan Regional Water Quality Control Board</td>
<td>10/16/2013</td>
<td>Regional Agency</td>
<td>The commenter highlights several areas for analysis in the Draft EIR including: existing hydrologic and water quality conditions and associated habitats; impacts to Houston Creek; the duration and timing of the Project; impacts to beneficial uses; and effects on water quality. The commenter notes that alternatives should avoid and minimize the impacts, and requests a Project Stormwater Pollution Prevention Plan (SWPPP) in addition to other mitigation that must be identified to reduce impacts. The commenter includes a discussion of laws, permits, and regulations applicable to the Project.</td>
<td>Section 3.8 Hydrology and Water Quality</td>
</tr>
<tr>
<td>State of California Native American Heritage Commission</td>
<td>9/23/2013</td>
<td>State Agency</td>
<td>The commenter recommends a record search be conducted for the Project and that all known resources recorded on or adjacent to the area of potential effect be listed in the Draft EIR. The commenter also recommends future coordination with the NAHC, the use of confidential addendums, and specific mitigation provisions. A list of Native American contacts with knowledge of the Project area is provided.</td>
<td>Section 3.5 Cultural and Paleontological Resources</td>
</tr>
<tr>
<td>County of San Bernardino Department of Public Works</td>
<td>10/16/2013</td>
<td>Local Agency</td>
<td>The commenter notes that road permits must be obtained from the Department’s Transportation Permit Section, and the local Fire Department should be consulted on temporary road width. The commenter provides guidance on traffic control compliance and recommends the installation of barriers during construction. The commenter also requests a Project construction management plan.</td>
<td>Section 3.13 Transportation and Traffic</td>
</tr>
</tbody>
</table>

1.5 Reader’s Guide

This EIR contains the information and analysis required by CEQA Guidelines Sections 15120 through 15132. Each of the required elements is covered in one of the EIR sections or their related appendices, which are organized as follows:

- **Executive Summary.** Provides a description of the proposed Project’s environmental review process, a summary of the proposed Project attributes and its impacts, a brief description of the proposed Project’s alternatives and identification of the environmentally superior alternative, and a summary of the proposed Project’s areas of known controversy and issues in need of resolution.

- **Section 1.0 – Introduction** contains a summary of the purpose and scope of the EIR, the historical background of the proposed Project, and the proposed Project’s objective.

- **Section 2.0 – Project Description** provides details on the proposed Project, including the general environmental setting, construction plan, operation and maintenance, required permits and authorizations, and environmental commitments to minimize impacts.
Section 3.0 – Environmental Setting, Analysis, and Mitigation Measures details environmental setting information, applicable regulations and standards, proposed Project impacts, and proposed mitigation measures for a wide range of resource areas. Section 3.1 provides an overview of the environmental setting, analysis, and mitigation, as well as the assumptions considered as part of the environmental impact analyses. Resource-specific analyses are included in the following sections:

- 3.2 – Aesthetics
- 3.3 – Air Quality and Climate Change
- 3.4 – Biological Resources
- 3.5 – Cultural and Historic Resources
- 3.6 – Geology and Soils
- 3.7 – Hazards and Hazardous Materials
- 3.8 – Hydrology and Water Quality
- 3.9 – Land Use
- 3.10 – Noise
- 3.11 – Utilities
- 3.12 – Recreation and Fisheries
- 3.13 – Traffic and Transportation
- 3.14 – Effects not Found to be Significant

Section 4.0 – Alternatives provides a comparison of the proposed Project impacts with those of Project alternatives developed by the County.

Section 5.0 – Cumulative Effects provides a description of the current and reasonably foreseeable projects located in the vicinity of the proposed Project, and the cumulative effects of these projects in combination with the proposed Project.

Section 6.0 – Other CEQA Considerations addresses other applicable CEQA requirements, including an analysis of growth-inducing effects, significant irreversible commitment of resources, and significant effects that cannot be avoided.

Section 7.0 – References and Organizations/Persons Consulted lists all of the informational references cited in this EIR, and lists all of the persons and agencies contacted and consulted during preparation of this EIR.

Section 8.0 – Glossary, Acronyms, and Abbreviations defines technical terminology, acronyms, and abbreviations used in this EIR.

Section 9.0 – Preparers of the EIR identifies the individuals who contributed to the preparation of this EIR.
2. Project Description

The California Division of Safety of Dams (DSOD) has restricted Lake Gregory’s optimum lake level until the discharge capacity of the outlet works and pending issues regarding dam stability during a seismic event are resolved. The proposed Project addresses the seismic stability of the dam by proposing a rehabilitation project, which consists of expanding the buttress on the downstream side of the existing dam.

2.1 Project Overview

The Lake Gregory Dam Rehabilitation Project (proposed Project) includes the following elements:

- Remove trees, vegetation, and existing rock from the downstream slope of Lake Gregory Dam;
- Remove foundation material at the downstream (dry) base of the dam to establish connection to bedrock;
- Construct a new 40-foot average thickness earthen buttress extending approximately 62 feet beyond the current toe of the dam;
- Install a layered drainage system for groundwater and lake seepage moving through the liquefaction zone;
- Place new rock layer of slope protection on the buttress;
- Retrieve stockpiled earthen material from the Thousand Pines Christian Camp, and haul material along paved roads to the dam (approximately 2 miles);
- Retrieve stockpiled material from the Papoose Dam, and haul material along paved public roads to the dam or Thousand Pines stockpile (approximately 10 miles);
- If required, establish two new borrow sites (Ponderosa East and Ponderosa West), and obtain mining permits and reclamation plans for each;
- Excavate, process, and haul material from Ponderosa West and Ponderosa East borrow sites for buttress construction (approximately 1.6 miles), if required;
- Obtain commercial material for buttress, filter, and drain soils at 8200 block of Alabama St., Redlands and 2400 block of West Highland, San Bernardino and haul material along public and private roads to Dam (approximately 16 miles), as needed;
- Temporarily place bridge reinforcements over Houston Creek in Camp Switzerland, to accommodate construction vehicles;
- Temporarily close, relocate, and/or alter traffic flow and patterns on Lake Drive as required for construction activities and public safety;
- Temporarily or permanently relocate utilities buried in Lake Drive if necessary;
- Temporarily adjust the lake level as may be required for construction, which would include discharge of lake water to Houston Creek if necessary; and
- Restore temporarily disturbed areas and repair of any damage to paved roads along the haul route.

Figure 2-1, Regional Overview of the Lake Gregory Dam Rehabilitation Project, shows the location of the proposed Project. Figure 2-2, Project Vicinity, shows the location of the Lake Gregory Dam, localized stockpile locations, the borrow site locations, and the haul routes. Figure 2-3 shows the locations and haul routes of regional buttress material sources. Figure 2-4 identifies the access to the dam through
Camp Switzerland. Figures 2-5 through 2-7 depict various options to redirect traffic flow on Lake Drive during Project construction. All figures are located at the end of this section.

### 2.2 Environmental Setting

Lake Gregory is located in the San Bernardino Mountains in the community of Crestline, approximately 14 miles north of the City of San Bernardino. The Project area is accessible via Lake Drive from Highway 138 to Crestline and is located on the north side of the lake nearest the intersection of Lake Gregory Drive and Edelweiss Drive. The immediate site of the dam is owned by San Bernardino County Regional Parks and is bordered by private property to the north and east. The community of Crestline is surrounded by San Bernardino National Forest, but the Project site, the stockpile areas, and the proposed borrow sites at Thousand Pines Christian Camp are on County and privately owned lands. The majority of the local area has been developed as residential and recreational land uses, and the surrounding landscape is mostly natural open space. None of the Project components or travel routes would be located on National Forest lands.

Lake Gregory has a current surface area of approximately 81 acres and a current maximum depth of approximately 60 feet at its ordinary high water mark. The spillway elevation is 4,517 feet above mean sea level. The Lake Gregory outflow follows Houston Creek and drains to Silverwood Lake, a reservoir five miles to the northwest.

The Lake Gregory Dam is a homogenous earth fill dam with a downstream rock fill shell constructed between 1936 and 1938. Lake Gregory was originally a privately built and owned recreational facility and has been in operation since the completion of the dam on October 26, 1938. The San Bernardino County Regional Parks Department took ownership of the dam, lake, the water in the lake, and the park on November 7, 1977 from the Crest Forest County Water District and now operates the Park as a public facility. Within the Park, the 81-acre lake is operated for public recreation (primarily as a boating and fishery resource). The Lake Gregory fishery is stocked annually with trout by the California Department of Fish and Wildlife (CDFW).

The landscape surrounding Lake Gregory consists of native and nonnative vegetation types. Native vegetation in the area includes montane coniferous and riparian forests. The area surrounding the dam consists primarily of open space, residential development, and the various Lake Gregory recreational facilities. Development adjacent to the dam includes a San Bernardino County fire station and Crestline Sanitation District facility. Camp Switzerland, a private campground with cabins, tent-camping, and RV hook-ups, is located about 500 feet downstream of the dam. Lake Drive traverses the crest of the dam and is the main thoroughfare for traffic around the lake.

The earthen materials stockpile location at Thousand Pines Christian Camp is approximately two miles from the dam (Figure 2-2). The County of San Bernardino holds a Temporary Use Permit for the five-acre stockpile yard. There is currently an estimated 6,000 cubic yards of sediment on site that was removed from the first phase of the Lake Gregory Swim Beach Silt Management Project. Another 5,000 cubic yards of material from a second phase of the sediment removal project has been recently added to the stockpile at the Christian Camp. The stockpile area at Thousand Pines Christian Camp is accessed via paved Pine Ridge Road and is surrounded by montane coniferous forests similar to those near the dam. Scrub vegetation and annual grassland occur in the immediate vicinity. A small ephemeral drainage and associated riparian corridor is present to the east of the stockpile. The area has been impacted by recent and historical human land uses.

Additional material for buttress construction will be obtained from two borrow sites located on property owned by the Thousand Pines Christian Camp, one additional dirt stockpile site located on County Service Area 70 D-1 (CSA 70), Arrowhead Dam Property near Papoose Lake in Lake Arrowhead, and commercial quarries located in the San Bernardino valley area. The Ponderosa East Borrow Site location is approximately
one air mile west of Lake Gregory Dam. Access to the site is from Thousand Pines Road and an unnamed dirt road within the camp. The Ponderosa West Borrow Site location is approximately 600 feet west of the Ponderosa East Borrow Site, and is accessed via the same unnamed dirt road. The Ponderosa West Borrow Site is situated between two buried water lines that run in northerly and northeasterly directions; excavation at this location would avoid the immediate areas of the water lines. Habitat at the borrow sites is montane coniferous forest similar to that near the dam. The borrow site locations are within a portion of the camp property that is not routinely used for camp activities and the sites are relatively undisturbed. The CSA 70 stockpile site is located adjacent to Papoose Lake in Lake Arrowhead nearest the intersection of Highway 173 and Torrey Road. The stockpile is approximately 10 miles from Lake Gregory Dam.

2.3 Proposed Project

The proposed Project includes the construction of physical improvements to the dam, earthen material hauling and processing, relocation of utilities on Lake Drive (if necessary), and interim traffic detour routes. Construction of the buttress would require removal of mature trees, vegetation, and rock from the downstream slope of the dam, and removal of foundation material at the base of the dam. The new earthen buttress would average 40 feet thick and would extend beyond the current toe of the dam. A drainage system would be installed to drain water from the liquefaction zone, and slope protection would also be installed on the new buttress.

The proposed Project looks to avoid the need to drain Lake Gregory to any significant degree. The lake is expected to be accessible for recreation purposes during Project construction. However, access to the swim beach may be affected if DSOD requires lowering the lake level up to 10 feet. Construction of the proposed Project could require temporary or permanent relocation of underground and overhead utilities which traverse the top of the dam along Lake Drive. Intermittent road closures are expected and will be necessary during construction, but alternate detour routes will be available for residents and recreational visitors. The temporary full closure of Lake Drive may be required to facilitate some construction activities relative to construction of the buttress to maintain safety.

The County may need to acquire property near the dam; however, the need for any property acquisition would not be known until further engineering is complete. Any property acquired would maintain uses similar to current uses on the property.

2.3.1 Construction Plan

Construction of the proposed Project is anticipated to take up to 12 months, to account for inclement weather. Buttress construction would take up to 6 months to complete. Table 2-1 presents the estimated duration of each construction activity; note that some activities may occur concurrently.
Table 2-1. Construction Plan¹

<table>
<thead>
<tr>
<th>Activity</th>
<th>Summary</th>
<th>Duration (Days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mobilization</td>
<td>• Mobilize vehicles, equipment, and materials to the Project site</td>
<td>5</td>
</tr>
<tr>
<td>Site Preparation</td>
<td>• Clear the work area below the dam with dozer</td>
<td>25</td>
</tr>
<tr>
<td></td>
<td>• Remove trees and shrubs from upstream and downstream slopes of the dam</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Remove and stockpile existing rock fill slope protection from downstream slope of the dam</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Preparation of the downstream embankment face and buttress foundation including removal of excessively saturated and/or organic material</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Remove camping facilities from work area (benches, poles, etc.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Load and haul waste material from dam preparation (vegetation, organic material, common fill, etc.)</td>
<td></td>
</tr>
<tr>
<td>Access Roads</td>
<td>• Document existing conditions along haul route</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>• Grade unpaved roads in Camp Switzerland to accommodate Project vehicles</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Install temporary bridge over existing Houston Creek bridge; reinforce other drainage crossings as necessary</td>
<td></td>
</tr>
<tr>
<td>Road Realignment</td>
<td>• Temporarily expand Lake Drive to 3 lanes by utilizing shoulder adjacent to the southern side of current roadway alignment</td>
<td>5</td>
</tr>
<tr>
<td>Utility Relocation</td>
<td>• Temporarily or permanently relocate utilities in Lake Drive over the crest of the dam, as needed</td>
<td>20</td>
</tr>
<tr>
<td>Excavate Material from Borrow Sites and Haul Material to Dam</td>
<td>• Excavate a maximum of approximately 40,000 cubic yards of soil from the Ponderosa West and Ponderosa East borrow sites over a 4-month period. Excavation would not occur concurrently at the two sites; it is expected that excavation would occur first at Ponderosa East and then would move to Ponderosa West once all available material has been excavated from Ponderosa East. Excavated material would be hauled directly to the work area at the dam. Use of commercial sources for dirt could reduce the volume of soil excavated from various sites by as much as 20,000 cubic yards.</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>• Traffic control/flag men along haul route(s) and at crest of dam (Lake Drive)</td>
<td></td>
</tr>
<tr>
<td>Haul Material to Dam from Stockpile</td>
<td>• Import up to 30,000 cubic yards of material from the Thousand Pines Christian Camp stockpile and stockpile at Papoose Dam near Lake Arrowhead, as needed, over a four-month period.</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>• Traffic control/flag men along haul route(s) and at crest of dam (Lake Drive).</td>
<td></td>
</tr>
<tr>
<td>Materials Processing</td>
<td>• Processing will occur at both the dam and the staging area.</td>
<td>80</td>
</tr>
<tr>
<td></td>
<td>• Windrow stockpiled material; mix with water and other soil to achieve desired consistency and moisture content</td>
<td></td>
</tr>
<tr>
<td>Construct Downstream Stabilization Buttress</td>
<td>• Construct buttress against downstream slope of dam (average thickness of buttress would be 40 feet)</td>
<td>100</td>
</tr>
<tr>
<td></td>
<td>• Install drainage system to drain water from the dam’s liquefaction zone</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Install stockpiled rock riprap that was removed from downstream slope of dam onto buttress for slope protection (3-4 weeks)</td>
<td></td>
</tr>
<tr>
<td>Site Reclamation and Street Improvements</td>
<td>• Restore temporarily disturbed areas with native vegetation</td>
<td>90</td>
</tr>
<tr>
<td></td>
<td>• Restore/reclaim borrow sites</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Internal and external roadways repaired as needed to maintain service and reestablish preconstruction conditions.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Restore Lake Drive to original alignment (if needed)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Restore utilities to original alignments (if relocation was temporary)</td>
<td></td>
</tr>
<tr>
<td>Demobilization</td>
<td>• Demobilize vehicles and equipment, and remove any remaining unused materials and waste from the Project site</td>
<td>5</td>
</tr>
</tbody>
</table>

¹ – Timelines presented in Table 2-1 are not cumulative; multiple activities would overlap during the construction phase. See Appendix 2 (Emission Calculation Assumptions) for details.
Hours of operation during construction would be limited to daylight hours, with typical work hours being 7:00 a.m. to 3:30 p.m., Monday through Friday. Construction activities could be severely curtailed or shut down during the snow season.

Up to approximately 70,000 cubic yards of earthen material would be required to construct the downstream stabilization buttress; the actual amount depends on final engineering and design as well as the composition of the material used. Material removed from the dam in preparation for buttress construction would be reused in the buttress with the exception of saturated soils and soils with a high amount of organic materials; all debris and soils that are unsuitable for buttress construction would be disposed of at an approved off-site facility. It is anticipated that Project work would begin in spring 2016.

### 2.3.1.1 Site Preparation

Site preparation would include clearing all vegetation along the upstream and downstream slopes of the dam, removal of rock fill slope protection and common fill along the downstream slope of the dam, removal of camping facilities (benches, poles, etc.), and relocation of utilities along the toe and crest of the dam, as required. The buttress installation area below the dam would be graded. The unpaved ingress/egress roads through Camp Switzerland would be graded to accommodate construction vehicles (see Figure 2-3), and temporary reinforcements over existing drainage crossings would be installed as needed. Material from the dam that can be processed and re-used will be placed in the appropriate processing area, and un-useable material including excessively saturated and organic material would be hauled out and disposed of at an approved landfill.

Existing rock fill slope protection removed from the dam slope would be stockpiled and then reused as slope protection on the buttress following construction. The rock would be stockpiled near the base of the dam (see Figure 2-3).

There is an existing concrete deck bridge over Houston Creek along the ingress and egress truck route in Camp Switzerland that is presumed to be structurally inadequate to support the weight of the loaded haul trucks. A temporary bridge would be placed over the existing bridge for reinforcement during construction; this bridge would be removed after construction is complete and the existing bridge would remain in place. The temporary bridge design has not yet been finalized, but is anticipated to be either a railroad flatcar or a truck ramp that would span the entire existing bridge.

The Project site at the base of the dam would be fenced for security and public safety during construction of the proposed Project. Fencing would be removed once the proposed Project is complete.

### 2.3.1.2 Earthen Material Sourcing

Buttress construction would require up to 70,000 cubic yards of earthen material. Earthen materials would be obtained from local dredging and sediment removal projects, commercial quarries, and excavation from up to two borrow sites as needed. The County has preliminarily identified the source material as the sediment from the Lake Gregory Swim Beach Silt Management Project currently stockpiled at the Thousand Pines Camp in Crestline from both phases of sediment removal, and additional Lake Arrowhead dredging material stockpiled at the Papoose Lake Dam in Lake Arrowhead. Material may also be excavated from two borrow sites on the Thousand Pines Christian Camp property (Figure 2-2). As needed, additional material would be obtained from commercial sources located near San Bernardino. Table 2-2 identifies the maximum amounts of buttress material that could be obtained from each source. Actual amounts and earthen material sources will be determined during final engineering; however, this EIR analyzes impacts from all potential sources.
## Table 2-2. Earthen Material Sourcing

<table>
<thead>
<tr>
<th>Source</th>
<th>Maximum Amount (cubic yards)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thousand Pines Stockpile</td>
<td>10,000&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Papoose Dam Stockpile</td>
<td>20,000&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ponderosa West Borrow Site</td>
<td>20,000&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Ponderosa East Borrow Site</td>
<td>20,000&lt;sup&gt;1&lt;/sup&gt;</td>
</tr>
<tr>
<td>Reused Material from Existing Dam</td>
<td>Unknown&lt;sup&gt;2&lt;/sup&gt;</td>
</tr>
<tr>
<td>Commercially Obtained (if needed)</td>
<td>20,000&lt;sup&gt;3&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

1 – Use of commercial sources for dirt would reduce the volume of soil excavated from various sites by as much as 20,000 cubic yards.

2 – The amount of soil that can be reused from the exiting dam is unknown at this time and is estimated at approximately 5,000 cubic yards; however, the maximum total amount of buttress material has been attributed to the offsite source locations as a worst-case scenario for the analyses in this EIR.

3 – Amount of material to be obtained from commercial sources will depend on final engineering.

As stated earlier, it is currently estimated that a total of up to 70,000 cubic yards of earthen material would be needed for the proposed buttress, as obtained from these various sources. As shown in Table 2-2, identified material sources could generate over 90,000 cubic yards, should the Project require additional material than currently estimated. The Project would first seek to use material from the stockpiles and existing dam. This material would be supplemented, as needed, by commercially obtained material and excavated material from up to two new borrow sites. The amount of material utilized from each source will depend upon final engineering, material quality, and other Project needs not fully known at this time. All material would be trucked directly to the construction site at the dam.

### 2.3.1.3 Material Import and Processing

The earthen material for the stabilization buttress would require processing before use to introduce clay and silt components to the granular material currently being stockpiled for the proposed Project. Materials would be processed at the construction site and borrow sites, and processing may also occur at staging and stockpile areas. Processing may include screening and separating material by size, and removal of deleterious materials for offsite disposal. Processing to meet specifications consists of mixing the stockpile soil with water and other soils of different textures to obtain the optimum moisture content and soil composition. Mixing generally entails windrowing the material and blading it with a motor grader to achieve the desired consistency. It is expected that waste material would be generated and would need to be stockpiled at another location, preliminarily identified as the existing Thousand Pines stockpile site.

Haul routes from the various local material locations are shown in Figure 2-2. For local material sources (Thousand Pines and Ponderosa sites), a fleet of 10 haul trucks would move material from the stockpile and the borrow sites (as needed) to the dam over a period of 40 to 60 days, with a maximum estimated 150 round-trip truck trips per day (15 round trips per truck). If required, borrow site excavation would occur after stockpiled material is trucked to the dam, and truck traffic from the borrow sites is not expected to overlap with traffic from the stockpile site.

The haul route from the Papoose Dam stockpile near Lake Arrowhead would be along County roads and would be about 10 to 12 miles long. The County estimates that up to 20,000 cubic yards may be trucked from this stockpile (see Table 2-2), hauling would occur over a period of 12 to 20 days. A fleet of 10 to 15 trucks would make a maximum of 150 round-trips per day. This travel route is shown in Figure 2-3.
The County has preliminarily identified two quarries in the San Bernardino valley area from which to source commercially obtained material, as needed. These quarries are located at the 8200 block of Alabama Street in Redlands and the 2400 block of West Highland Avenue in San Bernardino. Material would be trucked from one or both locations using public and private roads to the Dam (approximately 16-20 miles). The haul routes from the quarries would utilize Interstate 215 (I-215), State Route (SR) 210, SR 18, SR 138, and Lake Drive. During peak traffic times, an alternate route may be used to direct haul trucks away from downtown Crestline; this route would utilize Lake Gregory Drive from SR 18 to its terminus at Lake Drive. See Figure 2-3 for the haul routes from the commercial quarries. The County estimates that up to 20,000 cubic yards may be trucked from commercial sources (see Table 2-2), hauling would occur over a period of up to 45 days. A fleet of 15 trucks (10 cubic yard capacity per truck) would make a maximum of 4 round-trip truck trips each per day, totaling a maximum of 60 round-trips per day. Some or all of this truck fleet would likely be independent of that providing locally sourced material. These trips would overlap with truck trips delivering material from other source locations, as needed.

It is anticipated that the volume of truck traffic on the local roads would result in some damage to the asphalt paving. The County would document pre-haul conditions along the entire haul route to facilitate appropriate remediation of road damage following construction. During construction, traffic controls would be used to ensure safe and efficient use of the roads along the haul route by residents and construction vehicles, and to ensure that the Project does not impede emergency vehicle access.

Access to the construction area at the base of the dam would be through Camp Switzerland (see Figure 2-4). Ingress/egress roads are primarily unpaved, and would require grading for truck access. From Lake Drive, the ingress/egress road begins at the Houston Creek Plant Road, continues down slope into Camp Switzerland, crosses the Houston Creek bridge, continues along the toe of the existing downstream slope of the dam, and joins Lake Drive near the intersection of Lake Drive and Edelweiss Drive. The entire length of the ingress/egress route is 1,650 feet; of this, grading is anticipated to be required on 825 feet.

### 2.3.1.4 Construction of Buttress and Installation of Drains

Construction of the downstream stabilization buttress would occur over 4 to 6 months. A drainage system will be constructed consisting of a base filter layer, followed by a drainage layer, and another filter layer to be anchored by the buttress material. The buttress would average 40 feet thick including the drainage system and it will extend beyond the current embankment toe. Stockpiled rock slope protection removed during site preparation would be replaced onto the buttress at the completion of construction.

Existing seepage from the dam is minimal, and would be diverted around the work area during construction via a small drainage ditch or channel. If required by DSOD, the lake level may need to be lowered up to 10 feet during construction, to reduce the pressure on the dam. If lowering the lake level is required, the lake water would be discharged to Houston Creek through the existing outlet valve. The lake is expected to remain accessible for recreation purposes during construction.

### 2.3.1.5 Staging

Staging areas would be needed for processing, material stockpiles, and contractors’ equipment. The County has identified potential staging areas at current stockpile locations (Thousand Pines Camp and Papoose Lake Dam) and at the potential new borrow sites. Staging areas are available at the dam site, but areas are limited as the new buttress will encompass most of the available area.
2.3.1.6 Road and Utilities Relocation

Traffic across the segment of Lake Drive that traverses the crest of Lake Gregory Dam would be temporarily relocated or diverted to accommodate construction activities. The County has identified three options for traffic control during construction; all three options may be used during construction as needed:

- **Option 1** includes closing Lake Gregory Drive at the dam and rerouting traffic around the lake (see Figure 2-5, Option 1 – Traffic Reroute around Lake Gregory). Under Option 1, Lake Drive would be temporarily closed to through traffic between Lake Gregory Drive and Edelweiss Drive, and would detour around Lake Gregory using Lake Gregory Drive, San Moritz Drive, San Moritz Way, and Lake Drive on the east side of Lake Gregory. San Moritz Way is currently a one-way road with only southbound traffic south of Mountain High School. During periods when Lake Drive is closed at the crest of the dam and the detour is in effect, San Moritz Way would temporarily be utilized as a two-lane road to allow for traffic to travel both northbound and southbound. The road may require widening, traffic controls (signs, flashing lights, etc.), or other measures to accommodate both lanes of traffic at select locations. Specific measures and locations would be determined during final engineering.

- **Option 2**, a third traffic lane would be constructed from the existing wide shoulder/parking lane on the south side of Lake Drive over the crest of the dam (see Figure 2-6, Option 2 – Temporary Lake Drive Traffic Lane). The existing southbound lane would be closed to traffic to accommodate construction activities, and two-way traffic would utilize the existing northbound lane for southbound traffic and the new temporary lane for northbound traffic.

- **Option 3** would close both existing lanes and reduce traffic on Lake Drive to one lane during daytime construction activities, with flaggers directing traffic utilizing the new temporary lane (see Figure 2-7, Option 3 – One Lane Temporary Road). Upon completion of work each day, two-way traffic would be restored as described under Option 2.

The following utilities occur along Lake Drive at the crest of the dam and may require temporary or permanent relocation:

- Crestline Sanitation District – sanitary sewer line
- Crestline Village Water District – 8-inch water line and two fire hydrant relocations
- Southern California Edison – overhead and underground electrical conduit and cable
- Verizon – underground conduit and cable
- Southern California Gas Company – gas main pipeline

2.3.1.7 Post-Construction Site Reclamation and Road Repairs

Temporarily disturbed areas at the dam would be revegetated using appropriate native seeds or container plantings. Temporary road and bridge reinforcements, including the flatcar bridge over the existing Houston Creek bridge, would be removed following construction. Staging areas would be restored to pre-construction conditions.

The haul routes from Thousand Pines Camp to Lake Gregory Dam would be inspected immediately following construction, and all damage to the roadways would be repaired to pre-construction conditions. The stockpile site at the camp will be graded and restored per the conditions of the County’s Temporary
Use Permit. The borrow sites will be reclaimed per Surface Mining and Reclamation Act (SMARA) requirements, which is expected to include recontouring and planting the sites with native vegetation.

### 2.3.1.8 Labor and Equipment

The number of off-road vehicles and equipment to be used during construction of the proposed Project could vary from one or two to as many as 30, depending on actual site conditions, construction schedule, and the specific construction activity. The types of equipment anticipated to be required during construction of the proposed Project include the following: 50-ton hydraulic crane, forklifts, water trucks, scrapers, loaders, dozers, compaction equipment, wheel-mounted air compressor(s), excavators, pneumatic breaker, pneumatic-tired motor grader, steel drum roller, self-propelled paving machine, and haul trucks.

**Utilities.** A construction management trailer would be required to support construction of the proposed Project. Connection to power, water, and possibly telephone service would be required for the construction management trailer. Portable toilets would be provided on the construction site, and the construction management trailer would not require sewer service. The construction contractor selected to construct the proposed Project would be responsible for providing generators and fuel as needed to power the equipment and vehicles required during construction. If nighttime construction is required, the construction contractor would also provide the necessary lighting.

<table>
<thead>
<tr>
<th>Table 2-3. Construction Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equipment Type</strong></td>
</tr>
<tr>
<td>Site Preparation; Install Temporary Lane on Lake Drive and Relocate Utilities (as required)</td>
</tr>
<tr>
<td>Hydraulic Crane (50 ton)</td>
</tr>
<tr>
<td>Bulldozer</td>
</tr>
<tr>
<td>Grader</td>
</tr>
<tr>
<td>Backhoe Loader</td>
</tr>
<tr>
<td>Whole Tree Chipper</td>
</tr>
<tr>
<td>Chainsaws</td>
</tr>
<tr>
<td>Water Truck</td>
</tr>
<tr>
<td>Paving Machine</td>
</tr>
<tr>
<td>Dump Trucks</td>
</tr>
<tr>
<td><strong>Materials Import and Processing, Including Borrow Site Excavation</strong></td>
</tr>
<tr>
<td>Haul Trucks</td>
</tr>
<tr>
<td>Excavator</td>
</tr>
<tr>
<td>Bulldozer</td>
</tr>
<tr>
<td>Backhoe Loader</td>
</tr>
<tr>
<td>Grader</td>
</tr>
<tr>
<td>Whole Tree Chipper</td>
</tr>
<tr>
<td>Chainsaws</td>
</tr>
<tr>
<td>Water Truck</td>
</tr>
<tr>
<td><strong>Buttress Construction and Rock Slope Protection Placement</strong></td>
</tr>
<tr>
<td>Backhoe Loader</td>
</tr>
<tr>
<td>Dump Trucks</td>
</tr>
<tr>
<td>Bulldozer</td>
</tr>
<tr>
<td>Grader</td>
</tr>
<tr>
<td>Sheepsfoot / Roller / Tamper</td>
</tr>
<tr>
<td>Water Truck</td>
</tr>
</tbody>
</table>
Table 2-3. Construction Equipment

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Horsepower</th>
<th>Number</th>
<th>Hours / Day</th>
<th># Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Excavator</td>
<td>188</td>
<td>1</td>
<td>8</td>
<td>40</td>
</tr>
<tr>
<td>Hydraulic Crane (50 ton)</td>
<td>173</td>
<td>2</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Haul Trucks</td>
<td>ND*</td>
<td>2</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Grout Pump</td>
<td>43</td>
<td>1</td>
<td>8</td>
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</tr>
</tbody>
</table>

**Site Reclamation and Street Improvements**

<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Horsepower</th>
<th>Number</th>
<th>Hours / Day</th>
<th># Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paving Machine</td>
<td>121</td>
<td>1</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Compressor</td>
<td>100</td>
<td>1</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td>Water Truck</td>
<td>457</td>
<td>1</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td>Service Truck</td>
<td>ND*</td>
<td>2</td>
<td>8</td>
<td>30</td>
</tr>
<tr>
<td>Grader</td>
<td>220</td>
<td>1</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>Roller/Compactor</td>
<td>150</td>
<td>1</td>
<td>8</td>
<td>5</td>
</tr>
<tr>
<td>Hydroseeding Truck</td>
<td>ND*</td>
<td>1</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

* ND = Not determined. Horsepower is not determined for on-road vehicles/equipment because the air pollutant and greenhouse gas emissions from on-road vehicles/equipment is based on vehicle category, such as heavy duty diesel, rather than engine horsepower.

**Water.** During construction of the proposed Project, a water source would be required for soil compaction, dust suppression, concrete/grout/equipment wash-down (in designated areas per the Stormwater Pollution Prevention Plan [SWPPP]), concrete placement preparation, and possibly miscellaneous concrete or grout production. Based upon material to be compacted and dust control for the duration of the proposed Project, between 15 and 30 acre-feet of water may be used during construction. This water would be provided by the Crestline Village Water District. The availability of construction water would be verified prior to the issuance of a construction contract. Dewatering of shallow groundwater would be required during buttress construction and temporary realignment of Lake Drive. Water would be filtered to remove sediments and then routed to Houston Creek.

### 2.3.1.9 Temporary and Permanent Disturbance

The total area of temporary disturbance would be 4 to 5 acres, which includes the existing access road areas in Camp Switzerland, the realignment of Lake Drive, staging areas at Thousand Pines Christian Camp, and temporary disturbance at the base of the dam. Permanent disturbance would include approximately 2 acres at the stabilization buttress site and approximately 3 acres for the Ponderosa West and Ponderosa East borrow sites (1.5 acres each). Although the Project may not need one or both of the new borrow sites, this EIR analyzes use of both as a worst-case scenario. Therefore, permanent impacts would be up to 5 acres total.

### 2.3.2 Operation and Maintenance

The proposed Project would not appreciably change the operations and maintenance requirements for the dam. Operation and maintenance of the proposed Project would include the following:

- Vegetation control on the face of the buttress,
- Debris and trash removal,
- Erosion and slope repair, and
- Routine inspections.
2.4 Required Permits and Approvals

Construction and operation of the proposed Project may require the discretionary actions and approvals listed below, per jurisdiction. The San Bernardino County Development Code is not applicable to the proposed Project because State Division of Safety of Dams is the agency that issues permits for the dam.

Federal

- United States Army Corps of Engineers (USACE)
  - Clean Water Act Section 404

State

- California Department of Transportation
  - Transportation Permit
- California Department of Fish and Wildlife
  - Streambed Alteration Agreement/California Fish and Game Code Section 1600
  - Incidental Take Permit (for southern rubber boa)
- Native American Heritage Commission
  - Consultation on Sacred Areas to comply with State requirements
- State Water Resources Control Board
  - California General Permit for Discharges of Storm Water Associated with Construction Activity

Regional and Local

- San Bernardino County
  - Road Encroachment Permit
  - Tree or Plant Removal Permit
  - SMARA mining and reclamation permit for borrow sites
- Lahontan Regional Water Quality Control Board (RWQCB)
  - National Pollutant Discharge Elimination System (NPDES) Permit (SWPPP)
  - Water Quality Certification/Clean Water Act Section 401

2.5 Environmental Commitments

Several mechanisms have been incorporated into the proposed Project that would minimize potential environmental effects. The County has developed Environmental Commitments (ECs) that are specific to environmental issue areas, such as air quality, biological resources, or traffic impacts. All Project-related activity would be subject to the ECs. Table 2-4 lists the ECs incorporated into the proposed Project to minimize or avoid potential environmental impacts.
### Table 2-4. Environmental Commitments

<table>
<thead>
<tr>
<th>Environmental Commitment</th>
<th>Issue Areas Affected</th>
</tr>
</thead>
<tbody>
<tr>
<td>No vehicles will be operated in Houston Creek.</td>
<td>Biological Resources, Hydrology and Water Quality</td>
</tr>
<tr>
<td>Vehicle engine idling shall be limited to the extent feasible.</td>
<td>Air Quality</td>
</tr>
<tr>
<td>Vehicle speeds will remain below 10 mph on unpaved roads to minimize dust and reduce wildlife impacts.</td>
<td>Air Quality, Biological Resources</td>
</tr>
<tr>
<td>Vegetation will be removed from the dam outside of the bird breeding season (March-August).</td>
<td>Biological Resources</td>
</tr>
<tr>
<td>Photo documentation of the haul route will occur pre- and post-construction to document site conditions for post-construction road restoration.</td>
<td>Traffic and Transportation</td>
</tr>
<tr>
<td>The County shall present an environmental-education program to all personnel assigned to the Project. The program will describe sensitive resources and associated avoidance measures, Environmental Commitments, adopted mitigation measures from the Final EIR, environmental laws and regulations, permits, and all other agency requirements.</td>
<td>All</td>
</tr>
</tbody>
</table>
Regional Overview of the Lake Gregory Dam Rehabilitation Project

Figure 2-1

Project Site

Draft EIR November 2015

2-13
2. PROJECT DESCRIPTION

Figure 2-2

Project Vicinity and Localized Material Source Locations/Haul Routes
Lake Gregory Rehabilitation Project

2. PROJECT DESCRIPTION

Figure 2-3

Regional Material Source Locations/Haul Routes

Lake Gregory Dam Project Area
Haul Routes from Quarries
Haul Route from Papoose Dam Stockpile
2. PROJECT DESCRIPTION

Figure 2-4

Option 1 - Temporary Reroute around Lake Gregory

Figure 2-5

Figure 2-6

Option 2-
Temporary Lake Drive Traffic Lane
Utilities in the crest of the dam would be relocated only if determined necessary during final engineering.

Figure 2-7
Option 3-
One Lane Temporary Road

3. Environmental Setting, Analysis, and Mitigation Measures

3.1 Introduction to Environmental Analysis

Section 3 describes the potential environmental impacts associated with the construction and operation of the proposed Project. Based on the requirements of CEQA and comments received from the public, Section 3 evaluates the following issue areas:

- Aesthetics
- Air Quality and Greenhouse Gas Emissions
- Biological Resources
- Cultural and Paleontological Resources
- Geology and Soils
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use
- Noise
- Utilities
- Recreation and Fisheries
- Traffic and Transportation
- Effects not Found to be Significant (Agricultural, Paleontological, and Mineral Resources; Population, Housing, and Employment)

EIR Section 4 (Alternatives) provides an evaluation of the alternatives to the proposed Project that have been considered. EIR Section 5 (Cumulative Effects) provides the cumulative project scenario and potential impacts that the proposed Project may incrementally contribute to.

3.1.1 Environmental Assessment Methodology and Section Organization

The methodology used to determine potential Project impacts comprises four key components. Each of these components is summarized below and discussed under each resource area addressed in Sections 3.2 through 3.13.

- **Environmental Setting.** In most cases, the description of existing conditions in the environmental setting focuses on the immediate vicinity of the Project sites (dam, stockpile, borrow sites, and haul routes). For some resources, such as air quality and transportation, regional information is more appropriate.

- **Applicable Regulations, Plans, and Standards.** This includes a description of federal, state, and local regulatory framework applicable to the assessment of Project impacts.

- **Environmental Impacts and Mitigation Measures.** This includes the procedures followed to determine the type and magnitude of impacts that would occur, thresholds of significance, and Project impacts and mitigation measures.

  - **Thresholds of Significance.** Resource-specific thresholds, where appropriate, are used to evaluate the significance of environmental impacts. They are based on available resource agency thresholds, such as the South Coast Air Quality Management District’s air pollutant and greenhouse gases emissions thresholds, augmented where appropriate with those identified in the Initial Study Checklist included in Appendix G of the CEQA Guidelines, and modified as needed to address potential Project impacts.
3. ENVIRONMENTAL SETTING, ANALYSIS, AND MITIGATION MEASURES

Project Impacts. Each resource area analysis identifies direct and indirect impacts that would occur absent mitigation measures. Direct impacts are those that are caused by and immediately related to the proposed Project. Indirect impacts would occur later in time or farther removed in distance, but are still reasonably foreseeable effects of the proposed Project. The following determinations are used for classifying Project-related impacts:

- Significant and unavoidable impact; an adverse impact that cannot be mitigated to a level that is less than significant;
- Significant impact that can be mitigated to a level of less than significant through the implementation of recommended mitigation measures;
- Less than significant impact; an impact that is adverse but less than significant and mitigation is therefore not required;
- Beneficial impact; an impact that improves environmental conditions either directly or indirectly and mitigation is therefore not required; and
- No Impact; circumstances under which no direct or indirect effect would occur and mitigation is therefore not required.

Level of Significance after Mitigation. This section identifies the level of significance under CEQA, after implementation of environmental commitments and mitigation measures identified by the County to mitigate significant Project impacts.

3.1.2 Environmental Commitments and Mitigation Measures

Environmental commitments are identified in Table 2-4 in Section 2 (Project Description). These avoidance and minimization measures are part of the proposed Project, and the analysis of impacts under each issue area assumes full implementation of environmental commitments. Where significant environmental impacts would occur that would not be minimized or avoided through environmental commitments, mitigation measures have been identified as needed to reduce or avoid the potentially significant effects. Mitigation measures are identified under each applicable resource area analysis.
3.2 Aesthetics

This section discusses the potential aesthetic/visual resource impacts associated with the proposed Project. This section includes a discussion of the qualitative aesthetic characteristics of the existing environment that would be potentially affected by the implementation of the proposed Project, and the consistency of the proposed Project with relevant visual resources policies.

3.2.1 Environmental Setting

The proposed Project is located in Crestline, an unincorporated community in San Bernardino County. Additionally, Crestline is part of a larger community known as Crest Forest. The San Bernardino National Forest surrounds Crestline. The majority of the local area has been developed as residential and recreational land uses, and the surrounding landscape is mostly natural open space. None of the Project components is located on National Forest lands.

The community of Crestline is located north of SR-18 and east of SR-138. The proposed Project area is surrounded by a recreational camp, adjacent to a lake recreation area and surrounded by residential neighborhoods. Detailed descriptions of surrounding land uses can be found in Section 3.9 (Land Use).

On-site and Surrounding Visual Elements

Trees, vegetation and an existing rock fill slope cover the buttress site. The Project site is sloped and rocky with trees and vegetation scattered across it. Lake Gregory Regional Park, Camp Switzerland, a San Bernardino County fire station (not currently in use), the Crestline Sanitation District facility, and residences surround the immediate vicinity of the site.

The earthen materials stockpile location at the Thousand Pines Christian Camp is an existing stockpile yard. This site is accessed by Pine Ridge Road and is surrounded by coniferous forest lands and structures associated with the Camp. Similarly, the Ponderosa West and Ponderosa East borrow site locations are also owned by the Thousand Pines Christian Camp. These locations support and are surrounded by coniferous forest lands.

Light and Glare

There are two major causes of ambient light pollution that could generate adverse impacts, including glare and spill light. Glare occurs when our eyes see a bright object against a dark background, such as when we experience oncoming headlights while driving. Spill light is caused by misdirected light. The Project site currently produces minimal light in the area. Light from the camp mainly consists of facility lights and camper equipment such as flashlight and lanterns. Other sources of light in the vicinity include outdoor lights from surrounding residences.

Existing Viewer Groups

Viewer sensitivity or concern is based on the visibility of resources in the landscape, the proximity of viewers to the visual resources, the relative elevation of viewers to the visual resources, the frequency and duration of views, the number of viewers, and the types and expectations of the individuals and viewer groups. Generally, visual sensitivity increases with an increase in the total number of viewers, the frequency of viewing, and the duration of views. However, visual sensitivity is higher for views seen by people who are driving for pleasure, engaging in recreation activities, or are homeowners, and sensitivity is lower for people commuting to and from work.
Viewer groups associated with the proposed Project primarily consist of campers, residents, commuters, pedestrians and recreationists. Numerous residences are located within 0.5 mile of the site, commuters travel on Lake Gregory Drive and recreationists visit Lake Gregory. Camp Switzerland is a private campground that is usually open year round; however, due to the required dam improvements for public safety, the camp grounds have been closed until the proposed Project is completed. Based on frequency of viewing and duration of views, residents have the most visual sensitivity, followed by campers, recreationists, pedestrians and commuters.

### 3.2.2 Applicable Regulations, Plans, and Standards

#### San Bernardino County Open Space Element

The San Bernardino County Open Space Element works as a reference guide to facilitate the projection and preservation of open space, recreation and scenic areas. It provides policies for protecting and preserving the County’s scenic vistas. The following goals and policies are relevant to aesthetics issues related to the Project:

**GOAL OS 4.** The County will preserve and protect cultural resources throughout the County, including parks, areas of regional significance, and scenic, cultural and historic sites that contribute to a distinctive visual experience for visitors and quality of life for County residents.

**GOAL OS 5.** The County will maintain and enhance the visual character of scenic routes in the County.

**Policy OS 5.1** Features meeting the following criteria will be considered for designation as scenic resources:

**OS 5.3** The County desires to retain the scenic character of visually important roadways throughout the County. A “scenic route” is a roadway that has scenic vistas and other scenic and aesthetic qualities that over time have been found to add beauty to the County. The County designated Lake Gregory Drive as a scenic highway and applies all applicable policies to development on this routes (see Figures 2-4A through 2-4C of the Circulation and Infrastructure Background Report.

#### Crest Forest Community Plan Conservation

The Crest Forest Community Plan Conservation (Chapter 5) works as a reference guide to facilitate conservation. It provides goals for protecting and preserving the community’s scenic vistas. The following goals are relevant to aesthetics issues related to the Project:

**Goal CF/CO** 1. Preserve the unique environmental features of Crest Forest including native wildlife, vegetation, and scenic vistas.

**Goal HT/CO** 2. Maintain the health and vigor of the forest environment.

### 3.2.3 Environmental Impacts and Mitigation Measures

#### Impact Assessment Methodology

Characterizing aesthetics can be highly subjective; therefore, the evaluation of aesthetic resources in the landscape requires the application of a process that objectively identifies the visual features of the landscape and their importance, and the sensitivity of receptors that view them. Sensitive receptors that have views of the Project site are first identified and the relative importance of these views is determined.
The Project-related changes to the aesthetic character of the site and surrounding area are identified and qualitatively evaluated based on the modification of the physical conditions and the viewer sensitivity. The Project-related impacts are compared to the context of the existing setting using the threshold criteria discussed below. A policy analysis is also conducted to determine the Project’s consistency with relevant planning regulations and general plan goals, objectives, and policies.

**Thresholds of Significance**

The criteria used to determine the significance of an impact are based on the model initial study checklist contained in Appendix G of the State CEQA Guidelines. The proposed Project would be considered to have a significant environmental impact if it would:

- **AES-1:** Have a substantial adverse effect on a scenic vista;
- **AES-2:** Substantially degrade the existing visual character or quality of the site and its surroundings;
- **AES-3:** Conflict with established plans or policies concerning visual resources; or
- **AES-4:** Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

The following threshold from the CEQA Appendix G Environmental Checklist is not relevant to the proposed Project and is not discussed further beyond the summary below:

- **I (b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.**

The proposed Project site is not located in the vicinity of any state designated scenic highway. Additionally, views of the site would not be attained from any distant scenic highways. The nearest officially designated state scenic highway is a portion of State Route 38, located 26 miles to the southeast. Thus, the Project would not have the potential to damage scenic resources within a state scenic highway and there would be no impact under CEQA Threshold I (b).

**Project Impacts**

**Impact AES-1: The Project could have adverse effects on scenic vistas (Less than Significant)**

The Project site is a rocky fill slope covered with vegetation and trees, and the site is surrounded by trees. The Project would remove trees on the rock fill slope, but the trees surrounding the site would not be removed. The tree tops are visible from Lake Drive, the Lake Gregory Regional Park, and surrounding residences. The total area of temporary (construction) disturbance would be 4 to 5 acres, which would include the existing access road, the realignment of Lake Drive, stockpile retrieval, staging areas, and disturbance at the base of the dam. The permanent disturbance would include approximately 2 acres at the stabilization buttress site, including the area in which trees would be removed, and approximately 3 acres for the Ponderosa West and Ponderosa East borrow sites (1.5 acres each). Thus the existing scenic vista of tree tops visible from Lake Drive, the Lake Gregory Regional Park and surrounding residences would be minimally impacted. The Project impacts to the existing scenic vista would be less than significant and no mitigation is required.

The existing stockpile area and the proposed borrow sites are located on private properties that are surrounding by coniferous forest lands. There are no scenic vistas in the vicinity, so there would be no impact at these locations.
Impact AES-2: The Project could have adverse effects on visual character of the site and surroundings (Less than Significant)

The Project area is a slope covered with rock, vegetation and trees. Figure 3.2-1 shows the existing visual character of the Project area. The rock, vegetation and trees will be removed during the Project. Although the dam face must be maintained free of vegetation to comply with DSOD safety standards, the rocks removed from the dam slope during construction would be replaced onto the new buttress face for slope stabilization. The existing visual character of the surrounding area consists of vegetation, trees, and campsites in Camp Switzerland. The Project would not change the visual character maintained throughout Camp Switzerland from its present condition.

Sensitive receptors are areas in which the visual access of the surrounding area would most likely be affected by the implementation of the Project. Current views from the areas surrounding and including the Project site include Camp Switzerland, the Lake Gregory Regional Park, and nearby residences. Figure 3.2-1 shows the existing views from Camp Switzerland. Figure 3.2-2 shows the existing views from Lake Gregory. Figure 3.2-3 shows the existing views from nearby residences. Sensitive receptors that would be affected by the Project are primarily campers and secondarily residents and recreation visitors.

The existing stockpile area and the proposed borrow sites are located on private property owned by the Thousand Pines Christian Camp. The borrow sites are in areas of the property that are not routinely used for camp activities. The proposed Project would change the visual character of the borrow site areas by removing the vegetation and trees, and excavating the borrow sites. However, the trees and vegetation surrounding these sites would not be removed, and the sites would be subject to SMARA regulations which require site reclamation after the buttress construction is complete. Although reclamation would not re-establish pre-Project habitat values and structure for many years, if ever, these locations are located on a remote portion of the private camp’s property and are not visible to the general public.

Visual impacts to the buttress site, borrow sites, and their surroundings would be less than significant and no mitigation is required.

Impact AES-3: The Project would maintain consistency with visual resource goals and policies (Less than Significant)

The San Bernardino County General Plan and Crest Forest Community Plan present visual resource goals and policies for the Project area. The County policies encourage maintaining and enhancing the visual character along County-designated scenic highways such as Lake Gregory Drive. Additionally, the Crest Forest Community Plan policies state the importance of preserving unique environmental features as well as the health of the forest environment. The tree, vegetation, and rock removal associated with the proposed Project would result in less-than-significant impacts to the existing visual character along Lake Gregory Drive (see discussion under Impact AES-2). Furthermore, the Project would not impact the health of the forest environment. Thus, the Project is consistent with visual resource policies of the County plan and community plan, and impacts would be less than significant.
Figure 3.2-1

Existing Visual Character
Figure 3.2-2

Existing Views from Sensitive Receptors (Lake Gregory Drive)
Impact AES-4: The Project could create new sources of light and/or glare (Less than Significant with Mitigation)

The proposed Project construction schedule would be limited to daylight hours. The typical work hours are from 7:00 a.m. to 3:30 p.m., Monday through Friday. However, if nighttime construction is required or if construction lighting is required for any reason, glare from lighting can be reduced through proper lighting design. Variables affecting glare may include mounting heights, locations, and aiming of the luminaires. The proper design, along with the use of state-of-the-art reflectors and hoods on the luminaires would reduce the effects from glare substantially.

Additionally, the effects from spill light can affect nearby residences if the lighting design is not appropriately planned. These effects can be lessened or eliminated by taking proper steps in the initial design of the lighting. Implementation of Mitigation Measure AES-1 would require any lights used on the Project to be designed to minimize light and glare to receptors off site. Implementation of MM AES-1 would reduce impacts to less-than-significant levels.

No new permanent lighting would be introduced as a result of this Project. The removal of trees from the rock fill slope might allow camper lights to escape at night. However, it would not intensify existing lighting during the night, especially considering the new buttress would extend farther into the campground and any camper lights would therefore be farther from the dam and receptors along Lake Drive and Edelweiss Drive. Impacts from lighting during operation would be less than significant, and no mitigation would be required.

Mitigation Measure

MM AES-1 Minimize Lighting Impacts. The County will incorporate the following measures into the Project design to minimize impacts from lighting during construction.

- All lights will be aimed away from adjacent residences, and shall include glare shields and hoods. The lamp enclosures and poles shall also be painted to reduce reflection.
- Luminaires will be provided with filtering louvers and hoods.
- During installation, the luminaires will be aimed and corrected by a field crew to aim the lights away from areas where spill light is a problem.
- To minimize the light source and its image from a reflective surface, the contractor will ensure that the lighting is installed with shielding sufficient to reduce glare, thereby prohibiting substantial spillage of light onto adjacent properties.

3.2.4 Level of Significance After Mitigation

Implementation of MM AES-1 would reduce any lighting and glare impacts to a less-than-significant level. All other aesthetics impacts would be less than significant and would not require mitigation.
3.3 Air Quality and Greenhouse Gas Emissions

This section addresses both Air Quality and Greenhouse Gas Emissions. Air Quality is comprised of the analysis of the impacts of criteria and air toxic air pollutant emissions, while Greenhouse Gas Emissions is comprised of the analysis of the impacts of greenhouse gas (GHG) emissions and the effects of climate change.

3.3.1 Environmental Setting

Air Quality

Regional Climate

The proposed Project is located in Crestline within the South Coast Air Basin (SCAB) under the South Coast Air Quality Management District (SCAQMD) jurisdiction. Most of the SCAB is characterized by a Mediterranean climate with warm, dry summers and cool winters with seasonally heavy precipitation that occurs primarily during the winter months. Summers typically have clear skies, warm temperatures, and low humidity. However, the Project site is at an altitude of more than 4,500 feet above sea level and so has an alpine-influenced climate with generally cooler days and nights year round, particularly during winter, and more precipitation than the lower elevations. Some of the precipitation is in the form of snow rather than rain in the winter. A monthly climate summary for the community of Crestline is provided in Table 3.3-1. Average summer (June to September) high and low temperatures in the study area range from 81 °F to 49 °F. Average winter (December to March) high and low temperatures range from 53 °F to 29 °F. The average annual precipitation is approximately 42 inches with over 70 percent occurring between December and March. Summers are dry; starting in June, three straight months average an inch of precipitation or less. Little precipitation occurs during summer because of high-pressure cell blocks migrating storm systems over the eastern Pacific Ocean, but the San Bernardino Mountains do experience more rain in the summer than most of the SCAB, often in the form of desert monsoon-influenced summer thunderstorms.

The typical wind speeds and directions for the Project area, as depicted in Figure 3.3-1 using a wind rose from the Crestline air pollutant monitoring station, shows a strong predominant flow from the west southwest through the southeast, or from the South Coast Air Basin to the Mojave Desert Air Basin, with generally low wind speeds but with very few calm wind hours. This wind rose is based on five years of data between 2006 to 2009 and 2011, and the average wind speed during this five-year period was just under 3.7 miles per hour.

<table>
<thead>
<tr>
<th>Month</th>
<th>Temperature (°F)</th>
<th>Precipitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum</td>
<td>Minimum</td>
</tr>
<tr>
<td>January</td>
<td>44</td>
<td>29</td>
</tr>
<tr>
<td>February</td>
<td>47</td>
<td>30</td>
</tr>
<tr>
<td>March</td>
<td>53</td>
<td>32</td>
</tr>
<tr>
<td>April</td>
<td>60</td>
<td>35</td>
</tr>
<tr>
<td>May</td>
<td>67</td>
<td>41</td>
</tr>
<tr>
<td>June</td>
<td>76</td>
<td>49</td>
</tr>
<tr>
<td>July</td>
<td>81</td>
<td>55</td>
</tr>
<tr>
<td>August</td>
<td>81</td>
<td>55</td>
</tr>
<tr>
<td>September</td>
<td>76</td>
<td>50</td>
</tr>
<tr>
<td>October</td>
<td>64</td>
<td>41</td>
</tr>
<tr>
<td>November</td>
<td>52</td>
<td>34</td>
</tr>
<tr>
<td>December</td>
<td>45</td>
<td>29</td>
</tr>
</tbody>
</table>

Source: Intellicast, 2015
Air Pollutants and Monitoring Data

Air pollutants are defined as two general types: (1) “criteria” pollutants, representing six pollutants for which national and state health- and welfare-based ambient air quality standards have been established; and (2) toxic air contaminants (TACs), which may lead to serious illness or increased mortality even when present at relatively low concentrations. Generally, TACs do not have ambient air quality standards. The three TACs that do have ambient air quality standards (lead, vinyl chloride, and hydrogen sulfide) are pollutants that are not relevant to the proposed Project.

Criteria Pollutants

The U.S. Environmental Protection Agency (USEPA), California Air Resources Board (ARB), and the local air districts classify an area as attainment, unclassified, or nonattainment depending on whether or not the monitored ambient air quality data shows compliance, insufficient data available, or non-compliance with the ambient air quality standards, respectively. The National and California Ambient Air Quality Standards (NAAQS and CAAQS) relevant to the proposed Project are provided in Table 3.3-2; Table 3.3-3 summarizes the federal and state attainment status of criteria pollutants for the SCAQMD based on the NAAQS and CAAQS, respectively.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>California Standards</th>
<th>National Standards</th>
<th>Health Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ozone ((O_3))</td>
<td>1-hour</td>
<td>0.09 ppm</td>
<td>--</td>
<td>Breathing difficulties, lung tissue damage</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>0.070 ppm</td>
<td>0.075 ppm</td>
<td></td>
</tr>
<tr>
<td>Respirable particulate matter ((PM10))</td>
<td>24-hour</td>
<td>50 µg/m^3</td>
<td>150 µg/m^3</td>
<td>Increased respiratory disease, lung damage, cancer, premature death</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>20 µg/m^3</td>
<td>--</td>
<td></td>
</tr>
<tr>
<td>Fine particulate matter ((PM2.5))</td>
<td>24-hour</td>
<td>--</td>
<td>35 µg/m^3</td>
<td>Increased respiratory disease, lung damage, cancer, premature death</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>12 µg/m^3</td>
<td>12 µg/m^3</td>
<td></td>
</tr>
<tr>
<td>Carbon monoxide ((CO))</td>
<td>1-hour</td>
<td>20 ppm</td>
<td>35 ppm</td>
<td>Chest pain in heart patients, headaches, reduced mental alertness</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>9.0 ppm</td>
<td>9 ppm</td>
<td></td>
</tr>
<tr>
<td>Nitrogen dioxide ((NO_2))</td>
<td>1-hour</td>
<td>0.18 ppm</td>
<td>0.100 ppm</td>
<td>Lung irritation and damage</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>0.030 ppm</td>
<td>0.053 ppm</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3.3-2. National and California Ambient Air Quality Standards

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>California Standards</th>
<th>National Standards</th>
<th>Health Effects</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sulfur dioxide (SO2)</td>
<td>1-hour</td>
<td>0.25 ppm</td>
<td>0.075 ppm</td>
<td>Increases lung disease and breathing problems for asthmatics</td>
</tr>
<tr>
<td></td>
<td>3-hour</td>
<td>--</td>
<td>0.5 ppm</td>
<td></td>
</tr>
<tr>
<td></td>
<td>24-hour</td>
<td>0.04 ppm</td>
<td>--</td>
<td></td>
</tr>
</tbody>
</table>

Notes:
- ppm = parts per million; µg/m³ = micrograms per cubic meter; "--" = no standards
- 1 – The federal standard shown is the primary standard; the secondary standard is 15 µg/m³.
- 2 – The new federal 1-hour NO2 and SO2 standards are based on the 98th and 99th percentile of daily hourly maximum values, respectively.

Source: ARB, 2015a; ARB, 2001

### Table 3.3-3. Attainment Status for the SCAB

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Federal</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>O₃</td>
<td>Extreme Nonattainment</td>
<td>Extreme Nonattainment</td>
</tr>
<tr>
<td>PM10</td>
<td>Attainment/Maintenance</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>PM2.5</td>
<td>Nonattainment</td>
<td>Nonattainment</td>
</tr>
<tr>
<td>CO</td>
<td>Attainment/Maintenance</td>
<td>Attainment</td>
</tr>
<tr>
<td>NO₂</td>
<td>Attainment/Maintenance</td>
<td>Attainment</td>
</tr>
<tr>
<td>SO₂</td>
<td>Attainment</td>
<td>Attainment</td>
</tr>
</tbody>
</table>

Source: ARB, 2015b; USEPA, 2015a

Table 3.3-4 summarizes the historical air quality data for the Project area collected at the nearest representative air quality monitoring stations to Crestline. The air monitoring station used for ozone and PM10 is located in Crestline, while the air monitoring station used for PM2.5, CO, and NO₂ is located in San Bernardino and the air monitoring station used for SO₂ is located in Fontana. Table 3.3-4 presents the maximum pollutant levels measured from the monitoring stations from 2011 through 2013.

### Table 3.3-4. Background Ambient Air Quality Data

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Averaging Time</th>
<th>2011 ppm</th>
<th>2012 ppm</th>
<th>2013 ppm</th>
</tr>
</thead>
<tbody>
<tr>
<td>O₃</td>
<td>1-hour</td>
<td>0.160</td>
<td>0.140</td>
<td>0.120</td>
</tr>
<tr>
<td></td>
<td>8-hour</td>
<td>0.136</td>
<td>0.112</td>
<td>0.105</td>
</tr>
<tr>
<td>PM10</td>
<td>24-hour</td>
<td>43</td>
<td>43</td>
<td>37</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>19.0</td>
<td>18.9</td>
<td>21.4</td>
</tr>
<tr>
<td>PM2.5</td>
<td>24-hour</td>
<td>32.5</td>
<td>27.1</td>
<td>33.4</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>12.2</td>
<td>11.8</td>
<td>11.4</td>
</tr>
<tr>
<td>CO</td>
<td>8-hour</td>
<td>1.7</td>
<td>1.7</td>
<td>1.7</td>
</tr>
<tr>
<td>NO₂</td>
<td>1-hour</td>
<td>0.053</td>
<td>0.060</td>
<td>0.055</td>
</tr>
<tr>
<td></td>
<td>Annual</td>
<td>0.017</td>
<td>0.019</td>
<td>0.018</td>
</tr>
<tr>
<td>SO₂</td>
<td>1-hour</td>
<td>0.007</td>
<td>0.004</td>
<td>0.003</td>
</tr>
</tbody>
</table>

Notes:
- ppm = parts per million; µg/m³ = micrograms per cubic meter; "--" = no data
- 1 – Gaseous pollutant (ozone, SO₂, NO₂, and CO) concentrations are shown in ppm and particulate (PM10 and PM2.5) concentrations are shown in µg/m³.
- 2 – 24-hour PM2.5 data and 1-hour NO₂ data shown are the 98th percentile values and SO₂ for 2011 and 2012 are 99th percentile values.

Source: SCAQMD, 2015b.
The ambient air quality data shown above indicates that in the three years of data shown, the local Crestline area had experienced exceedances of the federal and state ozone standards. No exceedances of the federal or state PM10 standards were observed in Crestline and it is unlikely that PM2.5, CO, NO2, or SO2 standards were exceeded in Crestline, but this conclusion cannot be confirmed because the closest available monitoring data were collected in San Bernardino and Fontana.

**Sensitive Receptors**

There are residences, workplaces, and camping/lodging areas located as near as 165 feet (50 meters) from the Project work areas at the dam site. Receptor distances are more than 100 meters from most of the other work sites, such as the Ponderosa East and West borrow sites. The nearest school is Mountain High School which is located more than a quarter mile from the dam, and the nearest hospital is located several miles from the Project site.

**Greenhouse Gas Emissions**

### Climate Change

While climate change has been a concern since at least 1998, as evidenced by the establishment of the United Nations and World Meteorological Organization’s Intergovernmental Panel on Climate Change (IPCC), efforts devoted to GHG emissions reduction, and climate change research and policy have increased dramatically in recent years.

Global climate change (GCC) is expressed as changes in the average weather of the Earth, as measured by change in wind patterns, storms, precipitation, and temperature. Much scientific research has indicated that the human-related emissions of GHGs above natural levels are likely a significant contributor to GCC.

Because the direct environmental effect of GHG emissions is the increase in global temperatures, which in turn has numerous indirect effects on the environment and humans, the area of influence for GHG impacts associated with the proposed Project would be global. However, those cumulative global impacts would be manifested as impacts on resources and ecosystems in California. Additionally, as this analysis concerns cumulative global impacts, there is no separate cumulative impacts analysis for GCC in Section 5 (Cumulative Effects) of this EIR.

### Setting

The Project site is located in the community of Crestline in the extreme northern area of the SCAB bordering the Mojave Desert Air Basin. In California, ARB is designated as the responsible agency for traditional air quality regulations. In addition, Assembly Bill (AB) 32 vested ARB with regulatory authority for GHGs.

### Description of Greenhouse Gases

Greenhouse gases are gases that trap heat in the atmosphere and are emitted by natural processes and human activities. Examples of GHGs that are produced both by natural processes and by industry include carbon dioxide (CO2), methane (CH4), and nitrous oxide (N2O). The accumulation of GHGs in the atmosphere regulates the earth’s temperature. GHGs have varying amounts of global warming potential (GWP). The GWP is the ability of a gas or aerosol to trap heat in the atmosphere. By convention, CO2 is assigned a GWP of 1. In comparison, CH4 has a GWP of 25, which means that it has a global warming effect 25 times greater than CO2 on an equal-mass basis. To account for their GWP, GHG emissions are often reported as CO2e (CO2 equivalent). The CO2e for a source is calculated by multiplying each GHG emission
by its GWP, and then adding the results together to produce a single, combined emission rate representing all GHGs.

3.3.2 Applicable Regulations, Plans, and Standards

Air Quality

Sources of air emissions in the SCAB are regulated by the USEPA, ARB, and SCAQMD. In addition, regional and local jurisdictions play a role in air quality management. The role of each regulatory agency is discussed below.

Federal

The federal Clean Air Act (CAA) of 1970 and its subsequent amendments form the basis for the nation’s air pollution control effort. The USEPA is responsible for implementing most aspects of the CAA. Basic elements of the CAA include the establishment of NAAQS for major air pollutants, hazardous air pollutant standards, attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

The CAA delegates the enforcement of the federal standards to the states. In California, the ARB is responsible for enforcing air pollution regulations. In the SCAB, the SCAQMD has this responsibility.

State Implementation Plan

For areas that do not attain the NAAQS, the CAA requires the preparation of a State Implementation Plan (SIP), detailing how the state will attain and maintain the NAAQS within mandated timeframes. In response to this requirement, the SCAQMD and Southern California Association of Governments (SCAG) have developed air quality management plans (AQMPs). The focus of the 2003 AQMP was to demonstrate attainment of the federal PM10 standard by 2006 and the federal 1-hour O3 standard by 2010, while making expeditious progress toward attainment of state standards (SCAQMD, 2003). The 2003 AQMP also includes an NO2 maintenance plan.

The SCAQMD and SCAG, in cooperation with the ARB and the USEPA, have developed the 2007 AQMP for purposes of demonstrating compliance with the new NAAQS for PM2.5, the NAAQS for PM10, the 8-hour O3 NAAQS, the 1-hour O3 NAAQS, and other air quality planning requirements. The 1-hour O3 standard was revoked by the USEPA, but the SCAQMD is still tracking progress towards attainment of this standard. The SCAQMD Governing Board adopted the Final 2007 AQMP on June 1, 2007 (SCAQMD, 2007).

The AQMD Governing Board approved the 2012 AQMP on December 7, 2012 (SCAQMD, 2012). This plan addresses the 1-hour and 8-hour Ozone Plan inadequacies identified by the USEPA and provides a 24-hour PM2.5 plan. However, this AQMP has not yet been approved by the USEPA, so it is not the applicable AQMP for CEQA review.

Currently, the 2009 Maintenance Plan is the applicable plan for PM10, and the 2007 AQMP is the applicable plan for ozone and PM2.5.

Emission Standards for Non-Road Diesel Engines

The USEPA has established a series of cleaner emission standards for new off-road diesel engines culminating in the Tier 4 Final Rule of June 2004. The Tier 1, Tier 2, Tier 3, and Tier 4 standards require compliance with progressively more stringent emission standards. Tier 1 standards were phased in from
1996 to 2000 (year of manufacture), depending on the engine horsepower category. Tier 2 standards were phased in from 2001 to 2006, and the Tier 3 standards were phased in from 2006 to 2008.

The Tier 4 standards complement the latest 2007 and later on-road, heavy-duty engine standards by requiring 90 percent reductions in diesel particulate matter (DPM) and NO\(_x\) when compared against current emission levels. The Tier 4 standards are currently being phased in, starting with smaller engines in 2008 until all but the very largest diesel engines meet NO\(_x\) and particulate matter (PM) standards in 2015.

**Non-Road Diesel Fuel Rule**

In May 2004, the USEPA set sulfur limits for non-road diesel fuel. Under this rule, sulfur levels in non-road diesel fuel would be limited to 500 ppm starting in 2007 and 15 ppm starting in 2010 (USEPA, 2004), at which time it would be equivalent to sulfur content restrictions of the California Diesel Fuel Regulations (described below).

**Emission Standards for On-Road Trucks**

To reduce emissions from on-road, heavy-duty diesel trucks, the USEPA established a series of cleaner emission standards for new engines, starting in 1988. These emission standards regulations have been revised over time. The latest effective regulation, the 2007 Heavy-Duty Highway Rule, provides for reductions in PM, NO\(_x\), and non-methane hydrocarbon emissions that were phased in during the model years 2007 through 2010 (USEPA, 2000).

**State**

**California Clean Air Act**

In California, the ARB is designated as the responsible agency for all air quality regulations. The ARB, which became part of the California Environmental Protection Agency (Cal/EPA) in 1991, is responsible for implementing the requirements of the federal CAA, regulating emissions from motor vehicles and consumer products, and implementing the California Clean Air Act of 1988 (CCAA). The CCAA outlines a program to attain the CAAQS for O\(_3\), NO\(_2\), SO\(_2\), and CO by the earliest practical date. Since the CAAQS are often more stringent than the NAAQS, attainment of the CAAQS will require more emission reductions than what is required to demonstrate attainment of the NAAQS. Similar to the federal requirements, the state requirements and compliance dates are based on the severity of the ambient air quality standard violation within a region.

**Heavy Duty Diesel Truck Idling Regulation**

This ARB rule became effective February 1, 2005, and prohibits heavy-duty diesel trucks from idling for longer than five minutes at a time, unless they are queuing, and provided the queue is located more than 100 feet from any homes or schools (ARB, 2006).

**California Diesel Fuel Regulations**

In 2004, the ARB set limits on the sulfur content of diesel fuel sold in California for use in on-road and off-road motor vehicles (ARB, 2004). Under this rule, sulfur content of diesel fuel was limited to 15 ppm starting in June 2006.
Local

South Coast Air Quality Management District

The SCAQMD is primarily responsible for planning, implementing, and enforcing federal and state ambient standards within this portion of the SCAB. As part of its planning responsibilities, SCAQMD prepares Air Quality Management Plans and Attainment Plans as necessary based on the attainment status of the air basins within its jurisdiction. The SCAQMD is also responsible for permitting and controlling stationary source criteria and air toxic pollutants as delegated by the USEPA.

Through the attainment planning process, the SCAQMD develops the SCAQMD Rules and Regulations to regulate sources of air pollution in the SCAB (SCAQMD, 2015c). This Project would not include any stationary or portable stationary emissions sources that would be subject to SCAQMD air quality permitting regulations and no greenwaste composting would be done at the Project site. The SCAQMD rules applicable to the proposed Project are listed below.

SCAQMD Rule 401 – Visible Emissions. This rule prohibits discharge of air contaminants or other materials that are as dark or darker in shade as that designated No. 1 on the Ringelmann Chart, or that obscures an observer’s view.

SCAQMD Rule 402 – Nuisance. This rule prohibits discharge of air contaminants or other material that cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public; or that endanger the comfort, repose, health, or safety of any such persons or the public; or that cause, or have a natural tendency to cause, injury or damage to business or property.

SCAQMD Rule 403 – Fugitive Dust. The purpose of this rule is to control the amount of PM entrained in the atmosphere from man-made sources of fugitive dust. The rule prohibits emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area to be visible beyond the emission source’s property line. During Project construction, best available control measures identified in the rule would be required to minimize fugitive dust emissions from proposed earth-moving and grading activities. These measures would include site watering as necessary to maintain sufficient soil moisture content.

Additional Rule 403 requirements apply to large operations, which is defined as active operations on property that contains 50 or more acres of disturbed surface area; or any earth-moving operation with a daily earth-moving or throughput volume of 5,000 cubic yards or more, three times during the most recent 365-day period. These requirements include submittal of a dust control plan, maintaining dust control records, and designating a SCAQMD-certified dust control supervisor. The proposed Project’s construction would not exceed these two triggers and so would not be subject to these additional Rule 403 requirements.

SCAQMD Regulation XI – Source Specific Standards. This regulation is composed of several dozen individual rules, most of which are not applicable to this Project. Specific rules that may be applicable include:

- Rule 1133.1 - Chipping and Grinding Facilities. This rule would apply to the vegetation chipping proposed to handle the cleared vegetation. This Project would fall under exemption (f)(2) that would limit the rule requirements to compliance with part (d)(1), which does not allow the receipt of foodwaste. Foodwaste is not proposed to be accepted as part of the chipping operations.

- Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil. This regulation would only be applicable in the very unlikely event that contaminated soils are discovered during Project excavation work.
San Bernardino County

There are air quality goals and policies (Goal CO 4.) within the San Bernardino County General Plan (SBC, 2013), and general performance standards within the San Bernardino County Development Code (§83.01.040 Air Quality) (SBC, 2014). In general, compliance with SCAQMD rules and regulations will provide compliance with the potentially applicable policies (CO 4.1) and general performance standards [§83.01.040 (a) through (c)] of the General Plan and Development Code, respectively.

Greenhouse Gas Emissions

All levels of government have some responsibility for the protection of air quality, and each level (federal, state, and regional/local) has specific responsibilities relating to air quality regulation. Regulation of GHGs is a relatively new component of air quality. Several legislative actions have been adopted to regulate GHGs on a federal, state, and local level.

Federal

Massachusetts v. EPA

In April 2007, the U.S. Supreme Court held that GHG emissions are pollutants within the meaning of the CAA. In reaching its decision, the court also acknowledged that climate change results, in part, from anthropogenic causes. (Massachusetts et al. Environmental Protection Agency 549 U.S. 497, 2007). The Supreme Court’s ruling paved the way for the regulation of GHG emissions by USEPA under the CAA.

Clean Air Act

The federal CAA of 1970 and its subsequent amendments form the basis for the nation’s air pollution control effort. The USEPA is responsible for implementing most aspects of the CAA. Under the provisions of the CAA to protect public health and welfare, the USEPA has the authority to regulate GHGs, should a finding be made that GHGs have the potential for adverse impacts.

In response to the Supreme Court decision on December 7, 2009, the USEPA Administrator signed two distinct findings regarding GHGs under Section 202(a) of the CAA:

- **Endangerment Finding:** That the current and projected concentrations of the GHGs in the atmosphere threaten the public health and welfare of current and future generations, and
- **Cause or Contribute Finding:** That the combined emissions of GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution which threatens public health and welfare.

USEPA has enacted a number of regulations and other environmental rules regarding GHG emissions, including:

- Mandatory GHG Reporting,
- GHG Tailoring Rule for PSD Permits,
- GHG Vehicle Emissions Standards,
- Corporate Average Fuel Economy Standards, and
- Renewables Fuel Standard.

None of these federal regulations are specifically relevant to the construction or operation of the proposed Project.
State

California is one of several states that have set GHG emission targets. Executive Order S-3-05 and AB 32, the California Global Warming Solutions Act of 2006, promulgated targets to achieve reductions in GHG to 1990 GHG levels by the year 2020. This target-setting approach allows progress to be made in addressing climate change, and is a forerunner to setting emission limits.

**AB 32 – California Global Warming Solutions Act of 2006**

AB 32 was signed into law by Governor Schwarzenegger on September 27, 2006, and is the first law to comprehensively limit GHG emissions at the state level. The intent of AB 32 is to reduce California GHG emissions to 1990 levels by 2020. AB 32 instructs the ARB to adopt regulations that will reduce emissions from significant sources of GHG and establish a mandatory GHG reporting and verification program by January 1, 2008. AB 32 requires the ARB to adopt GHG emission limits and emission reduction measures by January 1, 2011, both of which became effective on January 1, 2012. AB 32 does not identify a significance level of GHG for CEQA purposes, nor has the ARB adopted such a significance threshold.

In accordance with AB 32, the ARB approved the Climate Change Scoping Plan (Scoping Plan) (ARB, 2008) in October 2008, which outlines California’s strategy for achieving the 2020 GHG emissions limit outlined under the law. The Scoping Plan includes recommendations for reducing GHG emissions from most sectors of the California economy, including; direct regulations, alternative compliance mechanisms, monetary and non-monetary incentives, voluntary actions, market-based mechanisms such as a cap-and-trade system, and an AB 32 cost of implementation fee regulation to fund the program. The AB 32 Scoping Plan update was approved at an Air Resources Board Hearing on May 22, 2014.

**Executive Order S-3-05**

Executive Order S-3-05, signed by Governor Schwarzenegger on June 1, 2005, calls for a reduction in GHG emissions to 1990 levels by 2020 and for an 80 percent reduction in GHG emissions by 2050. Executive Order S-3-05 also calls for the Cal/EPa to prepare biennial science reports on the potential impact of continued GCC on certain sectors of the California economy. The first of these reports, “Our Changing Climate: Assessing Risks to California,” and its supporting document “Scenarios of Climate Change in California: An Overview” were published by the California Climate Change Center in 2006.

**California Senate Bill 97**

Senate Bill 97, enacted in 2007, amends the CEQA statute to clearly establish that GHG emissions and the effects of GHG emissions are appropriate subjects for CEQA analysis. It directs the Governor’s Office of Planning and Research (OPR) to develop draft CEQA guidelines “for the mitigation of greenhouse gas emissions or the effects of greenhouse gas emissions” by July 1, 2009, and directs the California Natural Resources Agency to certify and adopt the CEQA guidelines by January 1, 2010.

The OPR published a technical advisory on CEQA and Climate Change on June 19, 2008. The guidance did not include a suggested threshold, but stated that the OPR has asked the ARB to, “recommend a method for setting thresholds which will encourage consistency and uniformity in the CEQA analysis of greenhouse gas emissions throughout the state.” The OPR does recommend that CEQA analyses include the following components:

- Identify Greenhouse Gas Emissions
- Determine Significance
Mitigate Impacts

On December 30, 2009, the California Natural Resources Agency adopted amendments to the CEQA Guidelines including GHG/Climate Change analysis guidelines. According to the California Natural Resources Agency (CNRA, 2009), “due to the global nature of GHG emissions and their potential effects, GHG emissions will typically be addressed in a cumulative impacts analysis.” Two GHG CEQA checklist items were included as part of the CEQA Guidelines amendment; they are discussed further in Section 3.3.3.

As discussed in Section 15064.4 of the CEQA Guidelines, the determination of the significance of GHG emissions calls for a careful judgment by the lead agency, consistent with the provisions in Section 15064. Section 15064.4 further provides that a lead agency should make a good-faith effort, to the extent possible and based on scientific and factual data, to describe, calculate, or estimate the amount of GHG emissions resulting from a project. A lead agency shall have discretion to determine, in the context of a particular project, whether to:

1. Use a model or methodology to quantify GHG emissions resulting from a project, and which model or methodology to use. The lead agency has discretion to select the model or methodology it considers most appropriate provided it supports its decision with substantial evidence. The lead agency should explain the limitations of the particular model or methodology selected for use; and/or
2. Rely on a qualitative analysis or performance-based standards.

Section 15064.4 also advises a lead agency to consider the following factors, among others, when assessing the significance of impacts from GHG emissions on the environment:

1. The extent to which the project may increase or reduce GHG emissions as compared to the existing environmental setting;
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project; and
3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of GHG emissions.

Local

South Coast Air Quality Management District

To date, the SCAQMD has developed two regulations regarding GHG emissions (SCAQMD, 2015c). Those regulations are:

SCAQMD Rule 2701 – SoCal Climate Solutions Exchange. This rule establishes a voluntary program to encourage, quantify, and certify voluntary high-quality certified GHG emission reductions in the district.

SCAQMD Rule 2702 – Greenhouse Gas Reduction Program. This program will fund projects through contracts in response to requests for proposals or purchase GHG emission reductions.

These two SCAQMD rules are not applicable to the proposed Project.

San Bernardino County

San Bernardino County has an approved Greenhouse Gas Emissions Reduction Plan. The discussion of the applicable requirements of this plan is provided within the discussion of Impact GCC-2 in Section 3.3.3.
3.3.3 Environmental Impacts and Mitigation Measures

This section analyzes the impacts associated with implementation of the proposed Project related to air quality and GHG emissions. The impact analysis lists the thresholds used to conclude the significance of an impact and describes the methods used to determine the proposed Project’s impacts. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, as needed.

Air Quality

Thresholds of Significance

The significance of potential air quality impacts were determined based on relevant State CEQA Guidelines, Appendix G. Project construction and operation would have significant air quality impacts if it would:

● **AQ-1:** Conflict with or obstruct implementation of the applicable air quality plan.

● **AQ-2:** Violate any air quality standard or contribute substantially to an existing or projected air quality violation.

● **AQ-3:** Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

The regional thresholds of significance for construction activities as shown below in Table 3.3-5 were used in this EIR to determine the significance of Project air quality impacts. These criteria are based on CEQA thresholds recommended by the SCAQMD (SCAQMD, 2015d).

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO&lt;sub&gt;x&lt;/sub&gt;</td>
<td>100 lbs./day</td>
</tr>
<tr>
<td>VOC</td>
<td>75 lbs./day</td>
</tr>
<tr>
<td>PM&lt;sub&gt;10&lt;/sub&gt;</td>
<td>150 lbs./day</td>
</tr>
<tr>
<td>PM2.5</td>
<td>55 lbs./day</td>
</tr>
<tr>
<td>SO&lt;sub&gt;x&lt;/sub&gt;</td>
<td>150 lbs./day</td>
</tr>
<tr>
<td>CO</td>
<td>550 lbs./day</td>
</tr>
</tbody>
</table>

Source: SCAQMD, 2015d

The proposed Project will not cause an increase in operations and maintenance requirements, so Table 3.3-5 does not include the SCAQMD regional emissions significance thresholds for operation emissions.

● **AQ-4:** Expose sensitive receptors to substantial pollutant concentrations.

SCAQMD has published localized thresholds of significance (LST) that are used to determine impacts on ambient air quality for off-site sensitive receptors (SCAQMD, 2015e). The published LSTs for construction activities, as shown below in Table 3.3-6, were used in this EIR to determine the significance of Project air quality impacts. The emissions impacts of TACs are also evaluated under this significance criterion, and SCAQMD’s thresholds for air toxics impacts are also shown in Table 3.3-6.
Table 3.3-6. SCAQMD LST and TACs Air Quality Emissions Significance Thresholds

<table>
<thead>
<tr>
<th>Localized Significance Criteria</th>
<th>Pollutant</th>
<th>Construction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>NOx</td>
<td>200 lbs./day</td>
</tr>
<tr>
<td></td>
<td>CO</td>
<td>1,463 lbs./day</td>
</tr>
<tr>
<td></td>
<td>PM10</td>
<td>22 lbs./day</td>
</tr>
<tr>
<td></td>
<td>PM2.5</td>
<td>6 lbs./day</td>
</tr>
<tr>
<td>TACs (includes carcinogens and non-carcinogens)</td>
<td>Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden &gt; 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic and Acute Hazard Index ≥ 1.0 (Project increment)</td>
<td></td>
</tr>
</tbody>
</table>

Source: SCAQMD, 2015d; SCAQMD, 2015e

The proposed Project is located in Source Receptor Area (SRA) 37 (Central San Bernardino Mountains). To be conservative, each of the specific Project work areas (dam and stockpile areas) are evaluated using the two-acre LST look-up values provided in SCAQMD CEQA guidance, and the minimum distance to sensitive receptors is assumed to be 50 meters (165 feet).

**AQ-5**: Create objectionable odors affecting a substantial number of people.

**Emission Calculations Methodology**

Air pollutant emissions from the proposed construction activities were calculated using the most current SCAQMD CEQA website and USEPA emission factors and methods, then compared to the thresholds identified in Tables 3.3-5 and 3.3-6 to determine their significance. Additional details on the specific emissions calculation methodology and assumptions are provided in Appendix 2 (Air Quality Calculations). The SCAQMD CEQA website off-road and on-road emissions factors are based on the California Air Resources Board OFFROAD and on-road EMFAC models adjusted for the South Coast Air Basin. For impacts that exceed a significance threshold, mitigation measures have been applied to reduce impacts to the extent feasible.

**Construction Emissions**

The proposed Project’s construction would involve the following elements:

- Removal of trees, vegetation, and existing rock from the downstream slope of Lake Gregory Dam;
- Removal of foundation material at the base of the dam;
- Construction of a new 40-foot average thickness earthen buttress extending beyond the current toe of the embankment;
- Installation of a drainage system for water moving through the liquefaction zone;
- Placement of new slope protection on the buttress;
- Retrieval of stockpiled earthen material from the Thousand Pines Christian Camp, and hauling of material along paved roads to the dam (approximately 2 miles);
- Retrieval and hauling of stockpiled material from the Papoose Dam (approximately 10 miles on paved roads);
Lake Gregory Dam Rehabilitation Project

3. ENVIRONMENTAL SETTING, ANALYSIS, AND MITIGATION MEASURES

Excavation and hauling of earthen material from the Ponderosa East and Ponderosa West borrow sites to the dam (approximately 1.6 miles);

Obtaining and hauling commercial material for buttress from two quarries in San Bernardino valley area (approximately 16 miles);

Temporary placement of bridge reinforcements over Houston Creek in Camp Switzerland, to accommodate construction vehicles;

Temporary relocation of Lake Drive;

Temporary or permanent relocation of utilities buried in Lake Drive; and

Restoration of temporarily disturbed areas and repair of any damage to paved roads along the haul route.

Construction emissions would result from the use of off-road construction equipment and the trips generated by construction workers and heavy haul trucks, and from earth-moving activities and paved and unpaved road travel that would cause fugitive dust emissions. Construction activities would generate emissions of criteria air pollutants VOCs, NOx, CO, PM10, PM2.5, and sulfur oxides.

Equipment usage and scheduling data needed to calculate emissions for proposed construction activities were developed by the County. Construction-related emissions are calculated using the following:

- On-road emissions factors and off-road diesel fueled equipment emission factors from the SCAQMD CEQA website (SCAQMD, 2015f) for the year 2015, where the off-road emissions factors are adjusted to account for ARB’s reduction in engine load factors used in the OFFROAD 2011 model, in comparison to the SCAQMD website emissions factors that are still based on the OFFROAD 2007 model with unadjusted engine load factors;

- Off-road gasoline fueled equipment emissions factors (i.e. for chainsaws) are from USEPA (USEPA, 2015c).

- USEPA AP 42 (USEPA, 2015b) emission factor calculations for fugitive dust emissions sources. Additional assumptions for calculation inputs were also derived from the SCAQMD Air Quality Handbook (SCAQMD, 1993).

For more information on the construction emissions calculation methodology, assumptions, and the detailed calculations, please refer to Appendix 2 (Air Quality Calculations) of this Draft EIR.

Operation Emissions

The proposed Project would not appreciably change the operations and maintenance requirements for the dam, so there are no incremental operations emissions from the proposed Project and operation emissions impacts are not evaluated further.

Environmental Controls

The County has not proposed any environmental controls directly related to reducing construction or operation air pollutant emissions, but fugitive dust emissions during construction would be controlled through compliance with SCAQMD Rule 403 – Fugitive Dust.

Project Impacts

**Impact AQ-1:** The Project could conflict with or obstruct implementation of the applicable air quality plan (Less than Significant)
The proposed Project would produce emissions of nonattainment pollutants primarily from
diesel-powered mobile on-road and off-road sources. The 2007 AQMP proposes emission reduction
measures that are designed to bring the SCAB into attainment of the NAAQS and CAAQS. The attainment
strategies in this plan include mobile source control measures and clean fuel programs that are enforced
at the federal and state levels on engine manufacturers and petroleum refiners and retailers.

The SCAQMD adopts AQMP control measures into the SCAQMD rules and regulations, which are then
used to regulate sources of air pollution in the SCAB. The proposed Project would comply with these
regulatory requirements. Therefore, the proposed Project’s emissions sources would meet or exceed the
emissions control forecasts for all approved AQMP control measures.

Since no growth will result from the implementation of this Project, it would not exceed the future growth
projections in the 2007 AQMP, and it would not conflict with or obstruct implementation of the SIP. As a
result, construction and operation of the proposed Project would conform to the applicable AQMP;
therefore, impacts would be less than significant and no mitigation is required.

**Impact AQ-2: The Project could violate any air quality standard or contribute substantially to an existing or projected air quality violation (Less than Significant)**

The proposed Project’s air pollutant emissions would occur for a short period, less than a year, and would
be well below the magnitude that would cause air quality standard violations or contribute substantially
to existing or projected air quality standard violations. Therefore, impacts are less than significant and no
additional mitigation is required.

Please see the regional emissions analysis provided below under Impact AQ-3 and the localized emissions
analysis provided under Impact AQ-4 for additional information.

**Impact AQ-3: The Project would result in cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) (Significant and Unavoidable)**

The Project’s maximum daily construction emissions estimate considered the construction phase
maximum equipment use and throughputs and the worst-case construction phase overlap. Detailed
assumptions for the construction phases, including equipment and on-road vehicle use, are provided in
Appendix 2 (Air Quality Calculations). Table 3.3-7 compares the maximum daily construction emissions of
the Project with the SCAQMD regional significance thresholds.

<table>
<thead>
<tr>
<th>Table 3.3-7. Maximum Daily Construction Emissions (lbs/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>VOC</strong></td>
</tr>
<tr>
<td>On-road vehicles</td>
</tr>
<tr>
<td>Off-road equipment</td>
</tr>
<tr>
<td>Fugitive dust</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>SCAQMD Regional Significance Thresholds</td>
</tr>
<tr>
<td>Significant?</td>
</tr>
</tbody>
</table>

Source: Appendix 2; SCAQMD, 2015d

As shown in Table 3.3-7, construction of the Project would result in NOx and PM10 emissions that exceed
the CEQA regional emissions significance threshold for NOx and PM10 established by the SCAQMD. All
other criteria pollutant emissions are estimated below the SCAQMD regional emissions significance
thresholds. Mitigation Measure AQ-1 (Fugitive Dust Control) would reduce fugitive dust emissions and the
Lake Gregory Dam Rehabilitation Project

3. ENVIRONMENTAL SETTING, ANALYSIS, AND MITIGATION MEASURES

regional particulate (PM10 and PM2.5) emissions impacts. This mitigation measure has been designed to provide feasible and effective control of PM10 and PM2.5 emissions. Mitigation Measures AQ-2 (Off-road Equipment Emissions Control) and AQ-3 (On-road Equipment Emissions Control) would provide feasible and effective control of emissions, specifically NOx emissions, from the off-road equipment and on-road vehicles. These three mitigation measures would comply with the requirements and intent of the San Bernardino County General Plan Policy CO 4.1, the San Bernardino County Development Code §83.01.040 Air Quality (SBC, 2014; SBC, 2013), and SCAQMD Rules and CEQA guidance.

The emissions estimate was reevaluated assuming implementation of Mitigation Measures AQ-1 (Fugitive Dust Control), AQ-2 (Off-road Equipment Emissions Control) and AQ-3 (On-road Equipment Emissions Control) (where no specific effect can be attributed in the calculations due to Mitigation Measure AQ-3), and Table 3.3-8 provides the mitigated worst-case daily emissions estimate.

Table 3.3-8. Mitigated Maximum Daily Construction Emissions (lbs/day)

<table>
<thead>
<tr>
<th></th>
<th>VOC</th>
<th>CO</th>
<th>NOx</th>
<th>SOx</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-road vehicles</td>
<td>6.04</td>
<td>29.87</td>
<td>63.12</td>
<td>0.14</td>
<td>3.21</td>
<td>2.65</td>
</tr>
<tr>
<td>Off-road equipment</td>
<td>24.96</td>
<td>107.16</td>
<td>65.83</td>
<td>0.13</td>
<td>3.23</td>
<td>2.97</td>
</tr>
<tr>
<td>Fugitive dust</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>--</td>
<td>115.73</td>
<td>20.51</td>
</tr>
<tr>
<td>Total</td>
<td>31.01</td>
<td>137.03</td>
<td>128.95</td>
<td>0.27</td>
<td>122.18</td>
<td>26.14</td>
</tr>
<tr>
<td>SCAQMD Regional Significance Thresholds</td>
<td>75</td>
<td>550</td>
<td>100</td>
<td>150</td>
<td>150</td>
<td>55</td>
</tr>
<tr>
<td>Significant?</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

Source: Appendix 2; SCAQMD, 2015d

As shown above in Table 3.3-8, the estimated maximum mitigated daily construction emissions for PM10 are below the SCAQMD Regional Significance Threshold, but for NOx the mitigated emissions remain above the SCAQMD Regional Significance Threshold, so the mitigated emissions impacts are significant and unavoidable. Mitigation Measure AQ-1 provides a large assumed reduction in the formation of unpaved road fugitive dust emissions; however, the effect of Mitigation Measures AQ-2 and AQ-3 are not sufficient to reduce the worst-case daily NOx emissions below the SCAQMD significance threshold. At this time it is not considered feasible to require the use of full Tier 4 off-road equipment and requiring interim Tier 4 would not reduce NOx emissions; and it is not considered feasible to require heavy on-road truck emissions mitigation beyond that which is already required through CARB-enacted vehicle standards.

As discussed in Section 2 (Project Description), a section of Lake Drive may not be passable during part of the construction period. Detours around this section of Lake Drive would result in additional travel miles for local residents and others who would typically use Lake Drive. While the total incremental travel that would be required by such a detour isn’t known, the related emissions from this traffic detour would primarily be from low-emitting passenger vehicles. Therefore, this indirect emissions source is not expected to be high enough to increase the emissions totals of any of the pollutants would not otherwise exceed the SCAQMD significance thresholds, and no additional mitigation is required.

Mitigation Measure

MM AQ-1 Fugitive Dust Control. The following dust control measures shall be implemented during Project construction:

a. The travel on unpaved areas will be minimized and traffic speeds on unpaved areas/roads shall be limited to 10 miles per hour for all on-road and off-road equipment.

b. All unpaved travel routes/roads shall be effectively stabilized using water at least three times daily.
c. All material excavated or graded will be sufficiently watered, prior to excavation or grading, to prevent excessive dust. Watering will occur as needed with complete coverage of disturbed areas. Hauled materials shall be moist while being loaded into or out of dump trucks.

d. The soil storage piles, if not covered, shall be watered at an adequate frequency, or sprayed with an environmentally safe chemical stabilizer, to create stabilized surfaces that will minimize wind erosion emissions. Additionally, the soil storage piles shall be watered by hand or covered when wind events are declared.

e. Construction activities that occur on unpaved surfaces shall be discontinued during windy conditions when those activities cause visible dust plumes that are transported beyond the site boundary or that remain visible within 100 feet of any occupied residence, school, or public recreation area.

f. All haul trucks hauling soil, sand, and other loose materials to or from the Project site shall be covered (e.g., with tarps or other enclosures that would reduce fugitive dust emissions) or have at least 18 inches of freeboard.

g. Drop heights should be minimized when loading into or unloading out of haul trucks, and gate seals should be tight on haul trucks.

h. Disturbed areas shall be minimized, and after active construction activity has ceased, disturbed areas shall be stabilized using non-toxic soil stabilizers approved by the County for Project use and shall be revegetated as soon as possible after disturbance.

i. Construction workers shall avoid driving commuting vehicles on unpaved roads in the Crestline area and shall park in paved areas.

j. Other fugitive dust control measures shall be implemented as necessary so that feasible dust controls are equivalent to the most effective measures listed within South Coast Air Quality Management District Rule 403 Tables 1 and 2 for each type of dust causing source category (unpaved roads, storage piles, etc.).

**MM AQ-2 Off-road Equipment Emissions Control.** Off-road equipment with engines larger than 50 horsepower shall have engines that meet or exceed USEPA/CARB Tier 3 Emissions Standards. Exceptions will be allowed only on a case by case basis for three specific situations: (1) an off-road equipment item that is a specialty, or unique, piece of equipment that cannot be found with a Tier 3 or better engine after a due diligence search; and/or (2) an off-road equipment item that will be used for a total of no more than 5 days; and/or (3) the off-road equipment is registered under CARB’s Statewide Portable Equipment Registration Program. Additionally, all off-road equipment engines shall be maintained in good operating condition and in tune per manufacturers’ specification, and equipment idling shall be limited to more than five minutes unless needed for proper operation.

**MM AQ-3 On-road Equipment Emissions Control.** All construction on-road vehicle engines, with the exception of personal vehicles, shall be turned off when not in use. Engine idling shall not exceed five (5) minutes unless required for proper operation for personnel health and safety (e.g., shelter from the elements). All construction on-road vehicle engines, with the exception of personal vehicles, shall be maintained in good operating condition and in tune per manufacturers’ specifications.
**Impact AQ-4:** The Project could expose sensitive receptors to substantial pollutant concentrations (Less than Significant with Mitigation [Localized Criteria Pollutant Emissions Impacts and Valley Fever Impacts]; Less than Significant [TAC Emissions Impacts])

### Localized Criteria Pollutant Emissions Impacts

SCAQMD LSTs are used to determine if a project could exceed ambient air quality thresholds for nearby receptors. The LSTs were established by SCAQMD for each SRA within their jurisdiction, and represent on-site emission levels that could cause ambient air quality standard exceedances or substantial contributions to existing exceedances at given distances from the site to nearby receptor locations.

The appropriate LSTs for Project site construction were compared to the assumed reasonably foreseeable maximum localized on-site daily construction emissions in Table 3.3-9.

#### Table 3.3-9. Maximum Daily Localized Construction Emissions (lbs/day)

<table>
<thead>
<tr>
<th></th>
<th>CO</th>
<th>NO₂</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-road vehicles</td>
<td>0.50</td>
<td>3.16</td>
<td>0.16</td>
<td>0.13</td>
</tr>
<tr>
<td>Off-road equipment</td>
<td>34.77</td>
<td>58.05</td>
<td>2.82</td>
<td>2.59</td>
</tr>
<tr>
<td>Fugitive dust</td>
<td>--</td>
<td>--</td>
<td>40.19</td>
<td>6.30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>35.27</td>
<td>61.21</td>
<td>43.16</td>
<td>9.02</td>
</tr>
<tr>
<td>SCAQMD Localized Significance Thresholds</td>
<td>1,463</td>
<td>200</td>
<td>22</td>
<td>6</td>
</tr>
<tr>
<td>Significant?</td>
<td>NO</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
</tr>
</tbody>
</table>

Source: Appendix 2; SCAQMD, 2015e

As shown above in Table 3.3-9 the estimated maximum daily localized construction emissions are above the SCAQMD localized significance for PM10 and PM2.5, but would remain under the thresholds for CO and NO₂. The worst-case localized emissions case for construction is not the same as the worst-case regional emissions case as shown previously in Table 3.3-8. The regional emissions case is composed of all emissions sources that are active on a worst-case day within the air basin, while the localized emissions case is composed entirely of worst-case daily emissions estimated to occur based on the maximum daily activity that could occur within the two acre dam construction site.

The emissions estimate was reevaluated assuming implementation of Mitigation Measure AQ-1 (Fugitive Dust Control), AQ-2 (Off-road Equipment Emissions Control), and AQ-3 (On-road Equipment Emissions Control), and Table 3.3-10 provides the mitigated worst-case localized emissions estimate.

#### Table 3.3-10. Mitigated Maximum Daily Localized Construction Emissions (lbs/day)

<table>
<thead>
<tr>
<th></th>
<th>CO</th>
<th>NO₂</th>
<th>PM10</th>
<th>PM2.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>On-road vehicles</td>
<td>0.50</td>
<td>3.16</td>
<td>0.16</td>
<td>0.13</td>
</tr>
<tr>
<td>Off-road equipment</td>
<td>34.77</td>
<td>51.69</td>
<td>2.63</td>
<td>2.42</td>
</tr>
<tr>
<td>Fugitive dust</td>
<td>--</td>
<td>--</td>
<td>18.47</td>
<td>1.30</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>35.27</td>
<td>54.85</td>
<td>21.26</td>
<td>3.85</td>
</tr>
<tr>
<td>SCAQMD Localized Significance Thresholds</td>
<td>1,463</td>
<td>200</td>
<td>22</td>
<td>6</td>
</tr>
<tr>
<td>Significant?</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
<td>NO</td>
</tr>
</tbody>
</table>

Source: Appendix 2; SCAQMD, 2015e

As shown above in Table 3.3-10 the estimated maximum mitigated daily localized construction emissions are below the SCAQMD LSTs, so the mitigated emissions impacts are less than significant.
TAC Emissions Impacts

The proposed Project’s TAC emissions and health risk potential are primarily associated with the DPM emissions from the diesel-fueled off-road and on-road engines. The emissions of acutely hazardous pollutants from Project emissions sources are negligible, so the primary potential health risk would be related to the carcinogenic and chronic risks from DPM exposure. However, the construction DPM emissions are low and the Project’s duration is short, so the construction emissions are not considered to be of concern in relation to the potential long-term health risk impacts from DPM exposure. Therefore, the proposed Project’s TAC emissions impacts would be less than significant.

Valley Fever

Valley Fever, or Coccidioidomycosis, is an illness caused by a Southern California endemic fungus, *Coccidioides immitis* (*C. immitis*). Persons exposed to airborne *C. immitis* arthrospores may become infected with Valley Fever. The resulting infection is most likely to have no symptoms or present with mild cold-like symptoms, but it can cause flu-like symptoms, or in rare cases (one percent of persons infected) cause a disseminated form of the disease that can cause severe disabling illness or death. Earthmoving and other activities that cause fugitive dust emissions can cause *C. immitis* arthrospores, if present, to become airborne. The proposed Project would require a large amount of earthmoving; however, much of this would be the movement of sediments recently dredged from Lake Gregory that would not have been subject to long-term *C. immitis* fungal growth. Additionally, the Project area has an average rainfall of approximately 40 inches, which is above the favorable range of rainfall associated with high levels of *C. immitis* growth (Kolivras, et al., 2001). So, while there may be some limited potential for the *C. immitis* fungus to exist in the Project area, the risk of Project activities causing Valley Fever infection is considered low due to the characteristics of the Project area, the type of sediment materials used, and the implementation of the recommended fugitive dust mitigation measures for this Project that will substantially reduce fugitive dust emissions. With implementation of Mitigation Measure AQ-1, impacts would be less than significant.

Mitigation Measure

MM AQ-1  Fugitive Dust Control

*Impact AQ-5: The Project could create objectionable odors affecting a substantial number of people (Less than Significant)*

Some objectionable odors may be temporarily created during construction-related activities, such as from diesel exhaust. Additionally, the proposed Project would use sediment dredged from Lake Gregory, which if not handled correctly could create odors from biological decomposition. However, the County would take measures to ensure the proper handling, aeration, and mixing of the dredged sediments to reduce significant odor formation. Therefore, due to the limited and mild odors created during Project construction, these odors would not affect a substantial number of people. Odor impacts would be less than significant, and no mitigation is required.

Greenhouse Gas Emissions

Thresholds of Significance

Appendix G of the CEQA Guidelines presents significance criteria that may be used by the lead agency to address and evaluate significance of an impact. According to these Guidelines, the following criteria may be used to establish the significance of GCC emissions (AEP, 2015).
Would the Project:

- Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?
- Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

On December 5, 2008, the SCAQMD Governing Board adopted the staff proposal for an interim GHG significance threshold for projects where the SCAQMD is lead agency. For industrial projects, a significance threshold of 10,000 metric tons of CO2e emissions per year was determined. Construction GHG emissions are required to be included, amortized over the project life, in the project’s annual GHG emissions totals.

In accordance with these guidelines, the proposed Project would have significant GCC impacts if it would:

- GCC-1: Produce GHG emissions that exceed the SCAQMD CO2e annualized significance threshold.
- GCC-2: Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.

**Emissions Calculations Methodology**

GHG emissions were calculated based on methodologies provided in *The Climate Registry – General Reporting Protocol* (TCR, 2013) (TCR Protocol), and emissions factors for the TCR Protocol updated in 2014 (TCR, 2015). The TCR Protocol is the guidance document that TCR members, which includes the State of California, use to prepare annual GHG inventories for the Registry. Direct GHG emissions would result from fuel use from the proposed construction activities. The Project would not consume electricity and would consume very limited quantities of water, primarily for dust control; therefore, indirect GHG emissions would be negligible.

**Impact GCC-1: The Project could produce GHG emissions that exceed the SCAQMD CO2e annualized significance threshold (Less than Significant)**

The proposed Project would generate GHG emissions through construction activities. The construction-phase GHG emissions would occur directly from the off-road heavy-duty equipment and the on-road motor vehicles needed to mobilize crew, equipment, and materials. The Project would also create a small amount of indirect GHG emissions from water use, but there is no incremental electricity use associated with this Project. The indirect GHG emissions are considered to be negligible and were not calculated for this Project. The Project does not increase operations and maintenance activities so there are no operation GHG emissions. Per SCAQMD interim guidance for assessing industrial Project impacts, the construction emissions are amortized over the Project life, which is considered to be a 50-year period for this Project.

Table 3.3-11 summarizes total annualized GHG emissions generated from Project construction. The CO2e emissions are compared against the SCAQMD interim threshold. Table 3.3-11 shows that construction of the proposed Project would have GHG emissions that are well below the SCAQMD GHG emissions significance criteria. Therefore, the Project would have less-than-significant GHG emissions impacts and no mitigation is required.

| Table 3.3-11. Summary of Project Greenhouse Gas Emission Estimates |
|------------------------|-----------------|
| **Emissions Source**   | **Annual CO2e, tons** |
| On-Road Emissions      | 357             |
| Off-Road Emissions     | 551             |
| Total Emissions        | 908             |
| Amortized Emissions (50 year-life) | 18          |
| SCAQMD Significance Threshold | 10,000     |
| Exceeds Threshold?     | NO              |

Source: Appendix 2, SCAQMD, 2015d.
**Impact GCC-2: The Project could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions (Less than Significant)**

Climate change is a global phenomenon, and the regulatory background and scientific data are changing rapidly. In 2006, the California state legislature adopted Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006. A number of other federal, state, and local regulations, plans, and policies have been developed recently for the purpose of reducing GHG emissions.

A summary of the compliance with all potentially applicable GHG plans, policies, and regulations is provided in Table 3.3-12. The GHG emissions for the proposed Project, as described above, are expected to be minimal during construction. Furthermore, maintenance of the proposed Project will not increase annual emissions from current levels or require the installation of new stationary sources of emissions. Therefore, the Project is not subject to the federal and state mandatory reporting regulation, the federal 40 CFR Part 52 permitting regulation, or the State Cap-and-Trade regulations.

<table>
<thead>
<tr>
<th>Adopted Plan, Policy, or Regulation</th>
<th>Consistency Determination</th>
<th>Proposed Project Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Federal</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40 CFR Part 98. Mandatory Reporting of Greenhouse Gases Rule.</td>
<td>Not Applicable</td>
<td>The Project would not have emissions sources that would be subject to this regulation.</td>
</tr>
<tr>
<td>40 CFR Part 52. Proposed Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule.</td>
<td>Not Applicable</td>
<td>The Project would not have emissions sources that would be subject to this regulation.</td>
</tr>
<tr>
<td><strong>State</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AB 32. Annual GHG Emissions Reporting</td>
<td>Not Applicable</td>
<td>The Project does not include emissions sources that would be subject to this regulation.</td>
</tr>
<tr>
<td>AB 32. Cap-and-Trade</td>
<td>Not Applicable</td>
<td>The Project does not include emissions sources that would be subject to this regulation.</td>
</tr>
<tr>
<td><strong>Local</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Bernardino County Greenhouse Gas Emissions Reduction Plan (SBC, 2011)</td>
<td>Consistent</td>
<td>The Project will not exceed the review standard threshold of 3,000 MT CO2e per year and is not subject to the County’s performance standards for development or commercial projects.</td>
</tr>
</tbody>
</table>

The Project-related construction sources for which GHG emissions were calculated include off-road diesel construction equipment, on-road trucks, and worker commute vehicles. Per the San Bernardino County Greenhouse Gas Emissions Reduction Plan guidance for assessing project impacts, the construction emissions are amortized over the Project life (50-year Project life is assumed) in order to determine their contribution to annual emissions over the lifetime of the Project. Table 3.3-13 indicates that the annualized GHG emissions are well below the San Bernardino GHG Emissions Reduction Plan review standard threshold of 3,000 MT CO2e per year.

<table>
<thead>
<tr>
<th>Table 3.3-13. Annual Greenhouse Gas Emission Estimates</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CO2e, metric tons</strong></td>
</tr>
<tr>
<td>Total Construction Emissions</td>
</tr>
<tr>
<td>Amortized Construction Emissions (50-year life)</td>
</tr>
<tr>
<td>SBC GHG Emissions Reduction Plan Review Standard Threshold</td>
</tr>
<tr>
<td>Exceeds Threshold?</td>
</tr>
</tbody>
</table>

Source: Appendix 2, SBC, 2011.
Table 3.3-14 identifies current potentially applicable California emission reduction strategies to reduce GHGs and identifies the Project design feature or mitigation measure that is proposed to comply with these potentially applicable strategies.

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Project Design/Mitigation to Comply with Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicle Climate Change Standards</td>
<td>These are ARB enforced standards; vehicles that access the Project that are required to comply with the standards would comply with these strategies.</td>
</tr>
<tr>
<td>Other Light Duty Vehicle Technology</td>
<td></td>
</tr>
<tr>
<td>Heavy-Duty Vehicle Emission Reduction Measures</td>
<td></td>
</tr>
<tr>
<td>Diesel Anti-Idling</td>
<td></td>
</tr>
<tr>
<td>Construction and Demolition Waste Reduction</td>
<td>The construction wastes from this Project will be reduced through the reuse of materials (dirt and rock) to the extent possible and there will be no concrete or metal wastes to recycle from this Project.</td>
</tr>
<tr>
<td>Increase Water Use Efficiency</td>
<td>Not directly applicable to the proposed Project. The water use for the Project is short-term and limited to that required for fugitive dust control and worker safety.</td>
</tr>
</tbody>
</table>


The Office of the California Attorney General maintains a website with a list of CEQA Mitigations for Global Climate Change Impacts (OAG, 2015). The Attorney General has listed some examples of types of mitigations that local agencies may consider to offset or reduce global climate change impacts from a project. The Attorney General stresses that the presented lists are examples of measures and policies that could be implemented, and are not intended to be exhaustive. Moreover, the measures cited may not be appropriate for every project, so the Attorney General suggests that the lead agency use its own informed judgment in deciding which measures it would analyze, and which measures it would require, for a given project.

The Attorney General suggests energy efficiency measures that could be undertaken or funded by a diverse range of projects, including: renewable energy, water conservation and efficiency, solid waste measures, land use measures, transportation and motor vehicles, and carbon offsets. However, most of the suggested measures would not be applicable to the proposed Project because they are more appropriate as measures to reduce long-term operation GHG emissions.

In summary, the proposed Project would conform to state and local GHG emissions/climate change regulations and policies/strategies; therefore, the proposed Project would have less-than-significant GHG impacts and no mitigation is required.

### 3.3.4 Level of Significance After Mitigation

#### Air Quality

Air quality impacts are significant and unavoidable after mitigation. Mitigation Measure AQ-1 would reduce the worst-case daily PM10 and PM2.5 emissions impacts from the dam site construction area, which otherwise may create significant regional impacts (PM10 only) and impacts to local residents, to less than significant. However, Mitigation Measures AQ-2 and AQ-3 would not reduce emissions enough to reduce the worst-case daily NOx emissions below the SCAQMD Regional Significance Threshold for NOx. Other air quality impacts were found to be less than significant without mitigation.

#### Greenhouse Gas Emissions

Impacts are less than significant and require no mitigation.
3.4 Biological Resources

This section describes the potential biological resources in the Lake Gregory Dam Rehabilitation Project (proposed Project) area, identifies the environmental and regulatory setting for the construction and operation of the proposed Project, evaluates potential impacts to biological resources, and recommends measures to mitigate impacts below a level of significance as needed.

3.4.1 Environmental Setting

Lake Gregory is in the San Bernardino Mountains in the community of Crestline, approximately 14 miles north of the City of San Bernardino. The majority of the local area has been developed as residential and recreational land uses. The landscape surrounding the community is mostly natural open space within the San Bernardino National Forest. However, the proposed Project is on County and private lands; none of the Project components are located on National Forest lands.

The San Bernardino Mountains are part of the Transverse Ranges, running generally east-west for about 55 miles. Maximum elevation is about 11,500 feet at Mount San Gorgonio, the highest peak in southern California. The terrain is rugged, with chaparral and shrubland at the lower elevations transitioning to mixed conifer–hardwood forest and conifer forest at the higher elevations. The climate of the mountains is characterized by warm, dry summers and cold, wet winters. Spring and fall are typically cool and wet; fog is common. Average temperatures in the area range from mid-30s in the winter to high 60s in the summer. Precipitation occurs mainly from late fall through early spring; snow is common at the higher elevations. Average annual precipitation is about 40 inches (WRCC, 2015).

Lake Gregory is in Township 2 North, Range 4 West, Section 23, as shown on the San Bernardino North 7.5-minute USGS topographic quad. Elevation ranges from approximately 4,480 to 4,580 feet above mean sea level.

Methods

For the purposes of biological resource surveys and analysis, the Project site is defined as the dam and downstream buttress area, temporary road and utility line relocation, haul routes, stockpile area, and borrow sites, plus a buffer of 100 feet surrounding each area. The Project vicinity is defined as the area within five miles of the Project site.

A reconnaissance-level field survey of botanical, wetland, and wildlife resources at the Project site (except the borrow sites) was conducted on March 14, 2014. A similar survey of the borrow sites was conducted on April 3, 2015. A list of species observed during the surveys is included in Appendix 3a.

In addition to the results of the reconnaissance survey, biological resource databases and other sources were reviewed for this analysis. Sources included the following:

- Notice of Preparation of a Draft Environmental Impact Report for Lake Gregory Dam Rehabilitation Project (County of San Bernardino Special Districts Department, 2013).
- Biological Resources Assessment for Lake Gregory Sediment Management and Bioretention Program (Liburn, 2014).
- Habitat Assessment and Focused Surveys for Southwestern Willow Flycatcher, Lake Gregory Silt Removal (Gonzales, 2013).
Lake Gregory Dam Rehabilitation Project
3. ENVIRONMENTAL SETTING, ANALYSIS, AND MITIGATION MEASURES

- California Department of Fish and Wildlife (CDFW; formerly the California Department of Fish and Game, CDFG) California Natural Diversity Database (CDFW, 2015a) for the following 7.5-minute USGS topographic quads: Lake Arrowhead, Harrison Mountain, San Bernardino North, and Silverwood Lake.
- California Native Plant Society (CNPS) Electronic Inventory of Rare and Endangered Vascular Plants of California (CNPS, 2015) for the topographic quads listed above.
- CDFW Special Animals List (CDFW, 2015b).
- The Jepson (2015) eFlora database of California plants; and
- Aerial and street-level photographs (Google, 2015).


Based on review of the literature and databases listed above, and on local expertise with the flora and fauna of the San Bernardino Mountains, lists of special-status plants (Table 3.4-2) and wildlife (Table 3.4-3) with potential to occur on the Project site or in the Project vicinity were compiled. Plant and wildlife taxa were considered to be special-status species if they were classified in one or more of the categories listed in Table 3.4-1.

### Table 3.4-1. Definitions of Special-Status Species

<table>
<thead>
<tr>
<th>Species Designation</th>
<th>Agency</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Federal Endangered</td>
<td>USFWS</td>
<td>A species that is in danger of extinction throughout all or a significant portion of its range.</td>
</tr>
<tr>
<td>Federal Threatened</td>
<td>USFWS</td>
<td>A species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.</td>
</tr>
<tr>
<td>Federal Candidate</td>
<td>USFWS</td>
<td>A species the US Fish and Wildlife Service (USFWS) has designated as a candidate for listing under Section 4 of the federal Endangered Species Act (ESA), published in its annual candidate review, and defined as a species that has sufficient information on its biological status and threats to propose it as endangered or threatened under the ESA, but for which development of a proposed listing regulation is precluded by other higher priority listing activities.</td>
</tr>
<tr>
<td>Federal Proposed</td>
<td>USFWS</td>
<td>A species that the USFWS has proposed for listing under Section 4 of the ESA, by publishing a Proposed Rule in the Federal Register.</td>
</tr>
<tr>
<td>Protected under the federal Bald and Golden Eagle Protection Act (BGEPA)</td>
<td>USFWS</td>
<td>Bald and golden eagles are protected from take, including harassment, except as permitted by USFWS.</td>
</tr>
<tr>
<td>State Endangered</td>
<td>CDFW</td>
<td>A species that is in serious danger of becoming extinct throughout all or a significant portion of its range due to one or more causes, including loss or change in habitat, overexploitation, predation, competition, or disease.</td>
</tr>
<tr>
<td>State Threatened</td>
<td>CDFW</td>
<td>A species that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.</td>
</tr>
<tr>
<td>State Candidate</td>
<td>CDFW</td>
<td>A species that has been officially noticed by the California Fish and Game Commission as being under review by the CDFW for addition to the</td>
</tr>
</tbody>
</table>
### Table 3.4-1. Definitions of Special-Status Species

<table>
<thead>
<tr>
<th>Species Designation</th>
<th>Agency</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fully Protected</td>
<td>CDFW</td>
<td>Animal species fully protected under the California Fish and Game Code. The CDFW may not issue take authorization except for scientific purposes or as provided under SB 618 (2011).</td>
</tr>
</tbody>
</table>
| Species of Special Concern | CDFW | A species, subspecies, or distinct population of an animal native to California that currently satisfies one or more of the following (not necessarily mutually exclusive) criteria:  
- Is extirpated from the state or, in the case of birds, in its primary seasonal or breeding role;  
- Is on the federal, but not state list, of threatened or endangered species;  
- Meets the state definition of threatened or endangered but has not formally been listed;  
- Is experiencing or formerly experienced serious (noncyclical) population declines or range retractions (not reversed) that, if continued or resumed, could qualify it for state threatened or endangered status; or  
- Has naturally small populations exhibiting high susceptibility to risk from any factor(s) that if realized, could lead to declines that would qualify it for state threatened or endangered status.  
This is an administrative designation and carries no formal legal status. This designation is intended to focus attention on animals at conservation risk, to stimulate research on poorly known species, and to achieve conservation and recovery before these species meet the California Endangered Species Act (CESA) criteria for listing. California Species of Special Concern are considered under the California Environmental Quality Act (CEQA) and require a discussion of impacts and appropriate mitigation to reduce impacts. |
| Watch List          | CDFW   | Taxa that were previously Species of Special Concern, but no longer merit that status or which do not meet criteria for designation as Species of Special Concern, but for which there is concern and a need for additional information to clarify status. |
| Special Animal      | CDFW   | An animal species that is tracked in the CNDDB, but has no other status at the state or federal level. |
| California Rare Plant Rank (CRPR) 1A | CDFW | Plants presumed to be extinct in California. |
| CRPR 1B             | CDFW   | Plants rare or endangered in California and elsewhere. |
| CRPR 2A             | CDFW   | Plants presumed extinct in California but more common elsewhere. |
| CRPR 2B             | CDFW   | Plants rare or endangered in California but more common elsewhere. |
| CRPR 3              | CDFW   | Plants about which more information is needed – a review list. |
| CRPR 4              | CDFW   | Plants of limited distribution – a watch list. |

In this context, *species* refers to a taxonomic entity and can include recognized subspecies, varieties, population segments, or other genetically or geographically distinct units. Most designated CRPR species also have “threat ranks” as an extension to the rank number, which designates the level of endangerment by a 0.1 to 0.3 ranking. A threat rank of 0.1 indicates that a plant is seriously endangered.
in California (high degree/immediacy of threat), 0.2 indicates that a plant is fairly endangered in California (moderate degree/immediacy of threat), and 0.3 indicates that a plant is not very endangered in California (low degree/immediacy of threats or no current threats known). All CRPR 1A and some CRPR 3 plants lacking any threat information receive no threat code extension.

Vegetation and Habitat

Vegetation and habitats in the Project site are shown on Figure 3.4-1 and described below.

**White Fir–Sugar Pine Forest**

Native forest communities surrounding the lake, on the canyon slopes downstream of the dam, and interspersed within the nearby residential areas consist of mixed hardwood and coniferous forest. Portions of the Project site are near residences, roads, and other sources of noise and human disturbance, while some portions are more secluded. The dominant tree species are white fir (*Abies concolor*) and incense cedar (*Calocedrus decurrens*), with other species such as Jeffrey pine (*Pinus jeffreyi*), sugar pine (*Pinus lambertiana*), black oak (*Quercus kelloggii*), canyon live oak (*Quercus chrysolepis*), and Coulter pine (*Pinus coulteri*) also present. The understory is relatively open with some shrub and herbaceous species present. Examples are Sierra currant (*Ribes nevadense*) and thimbleberry (*Rubus parviflorus*).

This vegetation best matches the description of white fir–sugar pine forest (*Abies concolor–Pinus lambertiana* forest alliance), while some portions better match descriptions of Jeffrey pine forest (*Pinus jeffreyi* forest alliance) in Sawyer et al. (2009). Jeffrey pine forest is not mapped separately on Figure 3.4-1. These forest communities best match the descriptions of upper montane mixed coniferous forest and Jeffrey pine forest in Holland (1986).

**White Alder Groves**

The canyon bottom downstream of the dam is vegetated with a dense stand of mature white alder (*Alnus rhombifolia*) with a sparse understory of California blackberry (*Rubus ursinus*), stinging nettle (*Urtica dioica* spp. *holosericea*), non-native eupatory (*Ageratina adenophora*), and bigleaf periwinkle (*Vinca major*). Several other annuals and perennials were also observed. This vegetation best matches the description of white alder groves (*Alnus rhombifolia* forest alliance) in Sawyer et al. (2009) and white alder riparian forest in Holland (1986).

The lower half of the downstream face of the dam is vegetated with mature white alders. The white alder groves extend below the dam face to the canyon bottom. There are several California coffeeberry (*Frangula californica*) shrubs and one large canyon live oak (*Quercus chrysolepis*) interspersed with the mature alders. This vegetation is similar to the description of the canyon bottom vegetation above.
3. ENVIRONMENTAL SETTING, ANALYSIS, AND MITIGATION MEASURES

Figure 3.4-1

Vegetation/Cover Type
- Annual brome grasslands
- Arroyo willow thickets
- Developed
- Open water
- White alder groves
- White fir-sugar pine forest

Lake Gregory Dam Rehabilitation Project
November 2014
Draft EIR
Annual Brome Grasslands

The upper half of the downstream face of the dam is vegetated primarily with non-native grasses such as ripgut brome (*Bromus diandrus*) and foxtail barley (*Hordeum murinum*) as well as other non-native herbs such as red stem filaree (*Erodium cicutarium*) and summer mustard (*Hirschfeldia incana*). This vegetation best matches the description of annual brome grassland (*Bromus diandrus* semi-natural herbaceous stands) in Sawyer et al. (2009) and non-native grassland in Holland (1986).

The proposed temporary road alignment and utility line relocation would run along the northwest margin of Lake Gregory. This area is largely open and treeless, but is covered by herbaceous species. The vegetation best matches the description of annual brome grassland above. In addition to the weedy grasses there are several species such as miniature lupine (*Lupinus bicolor*), English plantain (*Plantago lanceolata*) and slender buckwheat (*Eriogonum gracile*) present but much less common. There is a narrow unvegetated foot path used by recreationists to access to the lake.

Arroyo Willow Thickets

The few scattered trees include red willow (*Salix laevigata*), arroyo willow (*Salix lasiolepis*), white alder, and Fremont cottonwood (*Populus fremontii*). The trees are very sparse and appear to be maintained to allow easier recreational access. These patches of trees best match the description of arroyo willow thickets (*Salix lasiolepis* shrubland alliance) in Sawyer et al. (2009) and both southern willow scrub and southern cottonwood-willow riparian forest in Holland (1986).

There is a narrow band of riparian vegetation at the margin of the lake including evening primrose (*Oenothera elata* ssp. *hirsutissima*), common bog rush (*Juncus effusus* ssp. *austrocalifornicus*), and various sedges (*Carex* spp.). This band of riparian vegetation is not continuous and is less than five feet wide and therefore was not mapped on Figure 3.4-1.

The earthen materials stockpile location at Thousand Pines Christian Camp is surrounded by montane coniferous forest similar to that near the dam (white fir–sugar pine forest). The stockpile location is primarily covered in stockpiled material from the Lake Gregory Swim Beach Silt Management Project, but patches of scrub vegetation and annual brome grassland habitat are interspersed within the stockpile area. A small ephemeral drainage and associated riparian corridor are present to the east of the stockpile area. Several plant species generally associated with meadows were observed within and adjacent to the riparian corridor. The area has been impacted by recent and historical human land uses.

Vegetation at the Ponderosa East and Ponderosa West borrow sites is similar to that near the dam and is dominated by white fir–sugar pine forest with an understory of shrubs and annual grasses. There are three small ephemeral drainages within or adjacent to Ponderosa East and one small drainage adjacent to Ponderosa West. The vegetation at Ponderosa West is denser than Ponderosa East, and Ponderosa East may have been thinned at some point in the past. Both borrow sites are relatively pristine and show little sign of recent human disturbance.

Sensitive Natural Communities

The riparian communities on the Project site (white alder groves and arroyo willow thickets) are considered to be sensitive natural communities. The arroyo willow thickets vegetation type has a state rank of S4, indicating the community is apparently secure in California (CDFG, 2010). However, portions of this community may also be classified as southern cottonwood-willow riparian forest. Southern cottonwood-willow riparian forest has a rank of S3.2, indicating the community occupies between 10,000 and 50,000 acres in the state and is considered rare in California (CDFG, 2010). In addition,
arroyo willow thickets and white alder groves (also state rank S4) are treated here as sensitive communities because riparian communities may support several special-status wildlife species. These vegetation communities are described above. Other sensitive riparian communities, such as those included in the Sawyer et al. (2009) Pacific willow series, are found along Lake Gregory (Gonzales, 2013), but are not present on the Project site.

**Special-Status Plants**

Many of the special-status plants of the region are annuals or short-lived perennial herbs, which may not be recognizable during early spring, when reconnaissance-level field surveys were conducted. For these species, the following conclusions regarding occurrence probability are based on an evaluation of habitat suitability on the Project site.

Table 3.4-2 lists the special-status plant species known from the region and summarizes their habitat and distribution, conservation status, and potential for occurrence on the Project site. The potential for occurrence of each species is assessed based on the following criteria, but may be modified based on professional judgement of the surveying biologist:

- **Present**: Observed on the Project site during surveys or previously documented on the Project site.
- **High**: Documented in the Project vicinity (within about 5 miles) and suitable habitat found on the Project site, but not detected on the Project site during Project-specific biological surveys.
- **Moderate**: Either documented in the Project vicinity (within about 5 miles), or suitable habitat found on the Project site and the Project site is within species’ known geographic range.
- **Low**: There are no records in the Project vicinity (within about 5 miles), the habitat is marginal, or the species is conspicuous and was not detected during biological surveys.
- **Minimal**: There are no records in the Project vicinity (within about 5 miles) and the site lacks suitable habitat requirements.

A list of species considered, but determined to be unlikely to occur in the Project area is included in Appendix 3b of this Draft EIR, along with the rationale for rejecting these species.

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat and Distribution</th>
<th>Blooming Period</th>
<th>Potential to Occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bear Valley checkerbloom</td>
<td>Fed: none Calif: 1B.2</td>
<td>Perennial herb; meadows and seeps in riparian woodlands and coniferous forests. Restricted to the San Bernardino Mts., about 4900-8800 ft. elev.</td>
<td>May–August</td>
<td>Minimal. No suitable meadow or seep habitat, not observed.</td>
</tr>
<tr>
<td><em>Sidalcea malviflora</em> ssp. dolosa</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Common woolly sunflower</td>
<td>Fed: none Calif: 4.3</td>
<td>Perennial herb; coniferous forests in the San Bernardino Mts., about 3650-8200 ft. elev.</td>
<td>June–July</td>
<td>High. Suitable habitat present, record from 1 mi S of Project site, not observed.</td>
</tr>
<tr>
<td><em>Eriophyllum lanatum</em> var. obovatum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hall's monardella</td>
<td>Fed: none Calif: 1B.3</td>
<td>Perennial herb; chaparral, hardwood &amp; coniferous forest, and grasslands in S. Calif. mts., 2395-7200 ft. elev.</td>
<td>June–October</td>
<td>Low. Suitable habitat present, nearest record over 6 mi SE of Project site, not observed.</td>
</tr>
<tr>
<td><em>Monardella macrantha</em> ssp. hallii</td>
<td></td>
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</tr>
</tbody>
</table>
### 3. ENVIRONMENTAL SETTING, ANALYSIS, AND MITIGATION MEASURES

#### Table 3.4-2. Special-Status Plants Potentially Occurring on the Project Site

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat and Distribution</th>
<th>Blooming Period</th>
<th>Potential to Occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Laguna Mountains jewelflower</td>
<td>Fed: none Calif: 4.3</td>
<td>Annual or perennial herb; chaparral, hardwood &amp; coniferous forest, about 3900-8100 ft. elev.; mts. of S Calif. (gen. W. half of San Bernardino Mts.).</td>
<td>May–July</td>
<td>High. Suitable habitat present, reported within 0.1 mile of haul route.</td>
</tr>
<tr>
<td><em>Streptanthus bernardinus</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lemon lily</td>
<td>Fed: none Calif: 1B.2</td>
<td>Perennial bulb; meadows and seeps in riparian and coniferous forests in S. Calif. mts., 4000-9000 ft. elev.</td>
<td>July–August</td>
<td>Minimal. No suitable meadow or seep habitat present, well west of geographic range.</td>
</tr>
<tr>
<td><em>Lilium parryi</em></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Mojave phacelia</td>
<td>Fed: none Calif: 4.3</td>
<td>Annual; sandy or gravelly soil; dry meadows and streambeds gen. within pine forest in the San Gabriel &amp; San Bernardino Mts., about 4500-8100 ft. elev.</td>
<td>April–August</td>
<td>Moderate. Marginal habitat present, records from Project vicinity, not observed.</td>
</tr>
<tr>
<td><em>Phacelia mohavensis</em></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Palmer's mariposa-lily</td>
<td>Fed: none Calif: 1B.2</td>
<td>Perennial bulb; meadows and seeps in chaparral and coniferous forest in S. Calif. mts., about 3280-7840 ft. elev.</td>
<td>April–July</td>
<td>Minimal. No suitable meadow or seep habitat, not observed.</td>
</tr>
<tr>
<td><em>Calochortus palmeri</em> var.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parish's yampah</td>
<td>Fed: none Calif: 2B.2</td>
<td>Perennial herb; meadows and seeps in coniferous forests of the San Bernardino Mts., about 4800-9800 ft. elev.</td>
<td>June–August</td>
<td>Minimal. No suitable meadow or seep habitat, not observed.</td>
</tr>
<tr>
<td><em>Perideridia parishii</em> ssp.</td>
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</tr>
<tr>
<td><em>Plummeriella plummerae</em></td>
<td>Fed: none Calif: 4.2</td>
<td>Perennial herb; chaparral, cismontane woodland, coastal scrub, coniferous forests, and grasslands; granitic and rocky areas; much of cismontane S. Calif., about 330-5600 ft. elev.</td>
<td>May–July</td>
<td>Low. Minimally suitable habitat present, records from Project vicinity, not observed.</td>
</tr>
<tr>
<td>San Bernardino aster</td>
<td>Fed: none Calif: 1B.2</td>
<td>Perennial herb; meadows, seeps, springs, and other wet areas in coastal scrub, grasslands, chaparral and woodlands throughout S. Calif., sea level to 6600 ft. elev.</td>
<td>July–November</td>
<td>Minimal. Minimally suitable habitat present, no recent records in Project vicinity, not observed.</td>
</tr>
<tr>
<td><em>Symphyotrichum defoliatum</em></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>San Bernardino Mountains</td>
<td>Fed: none Calif: 1B.2</td>
<td>Perennial herb, pebbles &amp; rock outcrops (often carbonate); pinyon woodland, open pine forests in the San Bernardino Mts., about 5200-8500 ft. elev.</td>
<td>April–July</td>
<td>Minimal. No suitable habitat, below elevation range, not observed.</td>
</tr>
<tr>
<td><em>Dudleya abramsii</em> ssp. affinis*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>San Bernardino Mountains</td>
<td>Fed: none Calif: 1B.2</td>
<td>Annual; meadows, seeps, and pebble plains in chaparral, coniferous forest, and riparian woodlands of the San Bernardino Mts., about 4200-7800 ft. elev.</td>
<td>May–August</td>
<td>Moderate. Marginally suitable habitat present, reported from vicinity, not observed.</td>
</tr>
<tr>
<td><em>Castilleja lasiorhyncha</em></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Silver-haired ivesia</td>
<td>Fed: none Calif: 1B.2</td>
<td>Pebble plains, seasonal meadows and drainages in the San Bernardino Mts. and one site in Baja Calif., about 4900-8800 ft. elev.</td>
<td>June–August</td>
<td>Minimal. No suitable habitat, below elevation range, not observed.</td>
</tr>
<tr>
<td><em>Ivesia argyrocoma var. argyrocoma</em></td>
<td></td>
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</tr>
</tbody>
</table>
Table 3.4-2. Special-Status Plants Potentially Occurring on the Project Site

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat and Distribution</th>
<th>Blooming Period</th>
<th>Potential to Occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Southern jewelflower <em>Streptanthus campestris</em></td>
<td>Fed: none</td>
<td>Generally a biennial herb; shrublands, forests, woodlands, often rocky sites S. Calif. mts., about 2900–7600 ft. elev.</td>
<td>May–July</td>
<td>Moderate. Marginally suitable habitat present, documented roughly 2.5 miles SE of Project site, not observed.</td>
</tr>
<tr>
<td>Southern mountains skullcap <em>Scutellaria bolanderi</em> ssp. <em>austromontana</em></td>
<td>Fed: none</td>
<td>Perennial herb; mesic habitats in chaparral, coniferous forests, and cismontane woodland in S. Calif. mts., about 1400-6500 ft. elev.</td>
<td>June–August</td>
<td>Low. Marginal habitat present, known from one location in SB Mtns. over 5 miles NW, not observed.</td>
</tr>
</tbody>
</table>


**Status Codes**

**US Fish and Wildlife Service (Fed.) Designations:**
- END: Federally listed, endangered.
- THR: Federally listed, threatened.
- Cand: Candidate: Sufficient data available to support Federal listing, but not yet listed.
- Prop: Proposed: Candidate species found to warrant listing as either threatened or endangered and officially proposed as such in a Federal Register notice after the completion of a status review and consideration of other protective conservation measures.
- BGEPA: Bald and Golden Eagle Protection Act.

**California Department of Fish and Wildlife (Calif.) Designations:**
- END: State listed, endangered.
- THR: State listed, threatened.
- SCand: Candidate for state listing.
- SC: Species of Special Concern: Considered vulnerable to extinction due to declining numbers, limited geographic ranges, or ongoing threats.
- FP: Fully protected. May not be taken or possessed without permit from CDFW. Also includes protected furbearers.
- SA: Special Animal: An animal species that is tracked in the CNDDB, but has no other status at the state or federal level.

**California Rare Plant Rank (CRPR) designation**
- 1A: Plants presumed extinct in California.
- 1B: Plants rare, threatened, or endangered in California and elsewhere.
- 2: Plants rare, threatened, or endangered in California, but more common elsewhere.
- 3: Plants about which we need more information – a review list.
- 4: Plants of limited distribution – a watch list.
- .1: Seriously threatened in California (high degree/immediacy of threat).
- .2: Fairly threatened in California (moderate degree/immediacy of threat).
- .3: Not very threatened in California (low degree/immediacy of threats or no current threats known).

**CNDDB California State (S) Ranks**
- S1: Extremely endangered: <6 viable occurrences (EOs) or < 1,000 individuals, or 2,000 acres of occupied habitat.
- S2: Endangered: about 6-20 EOs or 1-3,000 individuals, or 2,000-10,000 acres of occupied habitat.
- S3: Restricted Range, rare: about 21-100 EOs or 3,000-10,000 individuals, or 10,000-50,000 acres of occupied habitat.
- S4: Apparently Secure: some factors exist to cause some concern such as narrow habitat or continuing threats.
- S5: Demonstrably Secure: commonly found throughout its historic range.

A question mark may be added to S ranks to indicate there is some uncertainty as to status.

**Listed Threatened or Endangered Plant Species.** Federal- or state-listed threatened or endangered plant species were not observed on the Project site during the field survey. There is no potential habitat for listed plant species on the Project site because all listed species of the San Bernardino Mountains are restricted to carbonate soils, pebble-plain, alkali lake beds, or montane meadows, primarily in the

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eastern half of the San Bernardino Mountains. There are no carbonate soils or pebble-plain on the Project site and the nearest occurrences of these habitats are well over ten miles to the east. There are no meadows on the Project site and the regional meadow-restricted listed plants are not known from meadows in the vicinity of the Project (CDFW 2015a). The Project site is not within designated critical habitat for any federally listed threatened or endangered plant species.

**Other Special-Status Plant Species.** One special-status plant, Parish’s alumroot (*Heuchera parishii*), with a CRPR of 1B.3 was observed on the Project site during the field survey. A patch of these plants was observed growing on the north-facing slope of Houston Creek, about twenty feet downslope of the haul route, south of Camp Switzerland. The plants were not in flower during the field survey, but Parish’s alumroot is the only similar alumroot species found in the habitat, geographic, and elevation ranges of the Project site. This patch of plants is outside the Project impact area and is not expected to be affected by Project activities.

One additional special-status plant with a CRPR of 1B, southern jewelflower (*Streptanthus campestris*), has a moderate potential for occurrence on the Project site. There are several records of this species in the Project vicinity, including one occurrence within 0.25 mile of the site (CDFW, 2015a), and suitable habitat is present on the site. Southern jewelflower was not observed during field surveys, but may not have been in flower by the survey date. If it were present in substantial numbers on the site, then its seedlings or remnant stems (from the previous year) would have been evident during the field surveys, but no such evidence of this species was observed. Therefore, if southern jewelflower is present on the site, it is only in relatively low numbers.

Three special-status plants with a CRPR of 4 have a moderate or high potential for occurrence: common woolly sunflower (*Eriophyllum lanatum var. obovatum*), Laguna Mountains jewelflower (*Streptanthus bernardinus*), and Mojave phacelia (*Phacelia mohavensis*).

There is suitable habitat for several additional special-status plant species; however, their likelihood of occurrence is either low or minimal; see Table 3.4-2.

**Wildlife**

Common wildlife species found on the Project site include reptiles and amphibians such as western fence lizard (*Sceloporus occidentalis*), southern alligator lizard (*Elgaria multicarinata*), and Monterey ensatina (*Ensatina eschscholtzii eschscholtzii*), birds such as Steller’s jay (*Cyanocitta stelleri*), common raven (*Corvus corax*), mountain chickadee (*Parus gambelii*), American robin (*Turdus migratorius*), dark-eyed junco (*Junco hyemalis*), and house finch (*Carpodacus mexicanus*), and small mammals such as deer mouse (*Peromyscus maniculatus*) and western gray squirrel (*Sciurus griseus*). Larger mammals such as mule deer (*Odocoileus hemionus*) and black bear (*Ursus americanus*) may forage on the site. Common bat species are likely to roost in trees or snags within the site.

Lake Gregory is stocked annually with catchable-size rainbow trout (*Oncorhynchus mykiss*) and brown trout (*Salmo trutta*) from both CDFW and private hatcheries. In 2010, eight fish species (in addition to trout) were found in the lake: black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), brown bullhead (*Ameiurus nebulosus*), goldfish (*Carassius auratus*), prickly sculpin (*Cottus asper*), common carp (*Cyprinus carpio*), largemouth bass (*Micropterus salmoides*), and tule perch (*Hysterocarpus traski*). Other fish species that have been documented in Lake Gregory are channel catfish (*Ictalurus punctatus*) and green sunfish (*Lepomis cyanellus*) (Liburn, 2013). All of these fish species have been introduced to Lake Gregory and are not native to the lake.
**Nesting Birds**

Nesting birds are protected under the federal Migratory Bird Treaty Act and California Fish and Game Code. The Project site has many trees, shrubs, and some rocky outcrops, as well as buildings (i.e., homes and other structures along the access routes) that provide nesting habitat. Common passerines (perching birds) are likely to nest in trees and shrubs on the site. At this elevation, most birds start nesting in April or May, and no bird nests were observed during the reconnaissance-level survey on March 14. Common bird species are expected to nest on the site, and one special-status bird species, California spotted owl, may also nest in more secluded portions of the site, particularly in or near the borrow sites.

**Special-Status Wildlife**

Table 3.4-3 lists the special-status wildlife species known from the region and summarizes their habitat, conservation status, and potential for occurrence on the Project site. The potential for occurrence is assessed based on the same criteria as listed under **Special-Status Plants** above. A list of special-status wildlife considered, but determined to be unlikely to occur in the Project area is included in Appendix 3b along with the rationale for rejecting these species.

### Table 3.4-3. Special-Status Wildlife Potentially Occurring on the Project Site

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat</th>
<th>Potential to Occur</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>INVERTEBRATES</strong></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Andrew’s marble butterfly</td>
<td>Fed: none</td>
<td>Shrubland, woodland, about 5000-6000 ft. elev.; endemic to San Bernardino Mtns.; several mustard family larval food plants.</td>
<td>High. Two larval food plants may be present in the vicinity. Type locality nearby.</td>
</tr>
<tr>
<td><em>Euchloe hyantis andrewsi</em></td>
<td>Calif: SA, S1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Santa Ana sucker</td>
<td>Fed: THR</td>
<td>Endemic to the Los Angeles, San Gabriel, and Santa Ana Rivers; habitat generalists, but prefer sand-rubble-boulder bottoms, cool, clear water, and algae.</td>
<td>Minimal. Believed extirpated from the upper Santa Ana River, last documented in 1982 in City Creek. No suitable habitat.</td>
</tr>
<tr>
<td><em>Catostomus santaanae</em></td>
<td>Calif: SC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arroyo chub</td>
<td>Fed: none</td>
<td>Major cismontane stream systems in S Calif. incl. Santa Ana River; extant populations near Riverside and down-stream. Introduced into various sites in CA outside its native range, including the Mojave River where it has hybridized with the Mohave tui chub. Prefers slow water stream sections with mud or sand bottom.</td>
<td>Low. Introduced populations in the Mojave River, suitable habitat present, but not favorable.</td>
</tr>
<tr>
<td><em>Gila orcuttii</em></td>
<td>Calif: SC</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Santa Ana speckled dace</td>
<td>Fed: none</td>
<td>Headwaters of the Santa Ana and San Gabriel Rivers; requires permanent flowing streams with temperatures between 17-20 degrees C; usually inhabits shallow cobble and gravel riffle.</td>
<td>Minimal. Occurs in upper Strawberry Creek and Twin Creek watersheds S of Project site, no suitable habitat.</td>
</tr>
<tr>
<td><em>Rhinichthys osculus</em> spp. 3</td>
<td>Calif: SC</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FISHES</strong></td>
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<tr>
<td><strong>AMPHIBIANS</strong></td>
<td></td>
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</tr>
<tr>
<td>California red-legged frog</td>
<td>Fed: THR</td>
<td>Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation; requires 11-20 weeks of permanent water for larval development; must have access to aestivation habitat.</td>
<td>Minimal. Most recent occurrence (1988) along west fork City Creek. Many occurrences in southern California have been extirpated. Suitable habitat may be present.</td>
</tr>
<tr>
<td><em>Rana draytonii</em></td>
<td>Calif: SC</td>
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</tbody>
</table>
### Table 3.4-3. Special-Status Wildlife Potentially Occurring on the Project Site

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat</th>
<th>Potential to Occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>San Gabriel slender salamander <em>Batrachoseps gabrieli</em></td>
<td>Fed: none Calif: SA, S2</td>
<td>Mesic canyons and talus slopes, cismontane San Gabriel and San Bernardino Mtns; about 3000 - 5000 ft. elev.</td>
<td>Low. Occurs in Waterman Canyon roughly 2.5 miles SW of Project site, marginally suitable habitat present.</td>
</tr>
<tr>
<td>Southern mountain (Sierra Madre) yellow-legged frog <em>Rana muscosa</em></td>
<td>Fed: END Calif: END</td>
<td>Inhabit perennial mountain streams (i.e. streams that contain plunge pools or backwaters year-round, although not necessarily flowing year-round) with steep gradients; found at moderate to high elevations; tadpoles may require 2-4 years to complete their aquatic development.</td>
<td>Minimal. Few occurrences in region. No suitable habitat.</td>
</tr>
<tr>
<td><strong>REPTILES</strong></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Coast horned lizard <em>Phrynosoma blainvillii</em></td>
<td>Fed: none Calif: SC</td>
<td>Forest, shrubland or grassland with sandy areas; W Calif. from LA Co. S through Baja Calif., below ±6000 ft. elev.</td>
<td>Low. Limited suitable habitat present.</td>
</tr>
<tr>
<td>Rosy boa <em>Charina trivirgata</em></td>
<td>Fed: none Calif: SA, S34</td>
<td>Rocky chaparral and desert shrubland; gen below 4500 ft. elev.; S Calif. through Baja Calif., SW Arizona, and western Mex.</td>
<td>Minimal. No suitable habitat, at margin of elevation range.</td>
</tr>
<tr>
<td>San Bernardino Mountain kingsnake <em>Lamproplepis zonata parvirubra</em></td>
<td>Fed: none Calif: SC</td>
<td>Forests and chaparral with rock outcrops or talus, often riparian, about 1200 – 8100 ft. elev.; San Gabriel, San Bern, San Jacinto Mtns.</td>
<td>High. Suitable habitat present, not observed, known from the area.</td>
</tr>
<tr>
<td>San Bernardino ringneck snake <em>Diadophis punctatus modestus</em></td>
<td>Fed: none Calif: SA, S2?</td>
<td>Gen. open, rocky areas; woodlands, shrublands, grasslands below about 7000 ft. elev.; Ventura, LA, Orange, SW San Bern. &amp; W Riverside Cos.</td>
<td>High. Suitable habitat present, records in Project vicinity, not observed.</td>
</tr>
<tr>
<td>Silvery legless lizard <em>Anniella pulchra pulchra</em> (<em>Anniella stebbinsi</em>)</td>
<td>Fed: none Calif: SC</td>
<td>Mtns and valleys, Bay Area to N Baja (excluding desert); shrublands and woodlands, loose soils and leaf litter, below about 6500 ft. elev.</td>
<td>High. Suitable habitat present, not observed; no records in Project vicinity, but species is highly cryptic.</td>
</tr>
<tr>
<td>Southern rubber boa <em>Charina umbratica</em></td>
<td>Fed: none Calif: THR</td>
<td>Montane forest and woodland; Mt. Pinos, San Bernardino and San Jacinto Mtns; usually cool, moist areas w/ deep rocky crevices (no records in San Gabriel Mtns but habitat and elev. seem suitable).</td>
<td>High. Suitable habitat present, not observed; several records in Project vicinity, but location information suppressed to protect species.</td>
</tr>
<tr>
<td>Two-striped garter snake <em>Thamnophis hammondii</em></td>
<td>Fed: none Calif: SC</td>
<td>Highly aquatic; found in or near permanent fresh water; often along streams with rocky beds and riparian growth</td>
<td>High. Occurs along most creeks on cismontane slope of San Bernardino Mtns. Suitable habitat present.</td>
</tr>
<tr>
<td>Western pond turtle <em>Emys marmorata</em></td>
<td>Fed: none Calif: SC</td>
<td>Perennial ponds, streams; breed &amp; overwinter in adj uplands; coastal S and cent. Calif., NW Baja Calif., below about 4800 ft. elev.</td>
<td>Low. Lake Gregory provides suitable habitat, but predatory fish drastically reduce likelihood of occurrence, not observed.</td>
</tr>
<tr>
<td><strong>BIRDS</strong></td>
<td></td>
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<tr>
<td>Bald eagle <em>Haliaeetus leucocephalus</em></td>
<td>Fed: BGEPA Calif: END</td>
<td>Breed in large trees, usually near major rivers or lakes; winters more widely; scattered distribution in N America; esp. coastal regions; formerly federally listed, delisted in 2007</td>
<td>Present. Regularly seen foraging on fish in Lake Gregory. Low nesting potential on Project site.</td>
</tr>
<tr>
<td>California horned lark <em>Eremophilus alpestris actia</em></td>
<td>Fed: none Calif: SA, S3</td>
<td>Open, flat lands incl. sparse sagebrush or grassland, meadows, alkali flats; wide elev. range; breeds in western Calif (San Diego Co through Humboldt Co) and Baja Calif; winters in same range.</td>
<td>Minimal. No suitable habitat, not observed.</td>
</tr>
<tr>
<td>Species</td>
<td>Status</td>
<td>Habitat</td>
<td>Potential to Occur</td>
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<tr>
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</tr>
<tr>
<td>California spotted owl&lt;br&gt; <em>Strix occidentalis</em></td>
<td>Fed: none&lt;br&gt; Calif: SC</td>
<td>Nests and forages year-around in dense conifer, oak, or (sometimes) riparian forest; Sierra Nevada, cent &amp; S Coast Ranges, S Calif mtns.</td>
<td><strong>High.</strong> Suitable foraging and nesting habitat throughout, known from immediate vicinity, not observed.</td>
</tr>
<tr>
<td>Least Bell’s vireo&lt;br&gt; <em>Vireo bellii pusillus</em></td>
<td>Fed: END&lt;br&gt; Calif: END</td>
<td>Summer resident of southern California in low riparian habitats in vicinity of water or dry river bottoms; found below 2000 ft.; nests primarily in willows and mulefat.</td>
<td><strong>Minimal.</strong> No suitable habitat, above elevation range, not observed.</td>
</tr>
<tr>
<td>Southwestern willow flycatcher&lt;br&gt; <em>Empidonax traillii extimus</em></td>
<td>Fed: END&lt;br&gt; Calif: END</td>
<td>Breeds in dense riparian forests &amp; shrublands, esp. in willows; scattered locations in Calif. and N Baja; near sea level to about 8000 ft. elev; winters in Cent. Amer.</td>
<td><strong>Minimal.</strong> No suitable nesting habitat, not observed. Protocol surveys in 2013 in potentially suitable habitat along SW and SE portions of Lake Gregory were negative.</td>
</tr>
<tr>
<td>Yellow warbler&lt;br&gt; <em>Dendroica petechia brewsteri</em></td>
<td>Fed: none&lt;br&gt; Calif: SC</td>
<td>Riparian plant associations; prefers willows, cottonwoods, aspens, sycamores, and alders for nesting and foraging</td>
<td><strong>High.</strong> Occurs along most creeks on cismontane slope of San Bernardino Mtns. Suitable habitat present, likely to occur.</td>
</tr>
<tr>
<td><strong>MAMMALS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>American badger&lt;br&gt; <em>Taxidea taxus</em></td>
<td>Fed: none&lt;br&gt; Calif: SC</td>
<td>Mountains, deserts, interior valleys where burrowing animals are avail as prey and soil permits digging; throughout cent and W N Amer.</td>
<td><strong>Moderate.</strong> Project site may provide suitable foraging habitat, record from about 5 mi east of Project site.</td>
</tr>
<tr>
<td>Fringed myotis&lt;br&gt; <em>Myotis thysanodes</em></td>
<td>Fed: none&lt;br&gt; Calif: SA, S4</td>
<td>Four-corners states through Calif., Pacific NW, and mainl. Mexico; arid forests &amp; wood, gen. 4000-7000 ft. elev.; roost in caves, buildings, &amp; rock crevices.</td>
<td><strong>High (foraging).</strong> Suitable foraging habitat present. <strong>Minimal (roosting).</strong> No suitable roosting sites present.</td>
</tr>
<tr>
<td>Hoary bat&lt;br&gt; <em>Lasiurus cinereus</em></td>
<td>Fed: none&lt;br&gt; Calif: SA, S4?</td>
<td>Common and widespread, found in a wide range of habitats, roosts in dense foliage of medium to large trees and forages in open areas or habitat edges.</td>
<td><strong>High.</strong> Suitable roosting and foraging habitat present.</td>
</tr>
<tr>
<td>Lodgepole chipmunk&lt;br&gt; <em>Neotamias speciosus speciosus</em></td>
<td>Fed: none&lt;br&gt; Calif: SA, S2S3</td>
<td>Pine forest, sometimes montane chaparral, above about 6400 ft. elev.; San Jacinto, San Bernardino, S Sierra, maybe San Gabr. Mtns.</td>
<td><strong>Low.</strong> Suitable habitat present, well below elevation range.</td>
</tr>
<tr>
<td>Long-eared myotis&lt;br&gt; <em>Myotis volans</em></td>
<td>Fed: none&lt;br&gt; Calif: SA, S4?</td>
<td>W N America, SE Alaska to Mexico; arid woods; wide elev. range; roost in buildings, crevices, trees; forage over water and in forest openings.</td>
<td><strong>High.</strong> Suitable roosting and foraging habitat present.</td>
</tr>
<tr>
<td>Long-legged myotis&lt;br&gt; <em>Myotis evotis</em></td>
<td>Fed: none&lt;br&gt; Calif: SA, S4?</td>
<td>W North America, British Columbia to N Baja; montane &amp; coastal conifer forests; roosts in trees, buildings and caves; forage in woods &amp; over water.</td>
<td><strong>High.</strong> Suitable roosting and foraging habitat present.</td>
</tr>
<tr>
<td>Northwestern San Diego pocket mouse&lt;br&gt; <em>Chaetodipus fallax fallax</em></td>
<td>Fed: none&lt;br&gt; Calif: SC</td>
<td>Open shrublands and sandy areas; coastal and interior valleys of SW Calif. (E LA Co., Orange, Riverside, San Bern., San Diego Cos.) and NW Baja Calif.</td>
<td><strong>Minimal.</strong> Suitable habitat present, above elevational range.</td>
</tr>
<tr>
<td>Ringtail&lt;br&gt; <em>Bassariscus astutus</em></td>
<td>Fed: none&lt;br&gt; Calif: FP</td>
<td>Most of Calif and the SW US, to tropical Mexico; forests, woodlands, deserts; nocturnal; dens in burrows, trees, or rock crevices.</td>
<td><strong>Moderate.</strong> Suitable habitat present; not tracked in the CNDDB, but known from the area.</td>
</tr>
<tr>
<td>San Bernardino flying squirrel&lt;br&gt; <em>Glaucomys sabrinus californicus</em></td>
<td>Fed: none&lt;br&gt; Calif: SC</td>
<td>Mesic forest w/ white fir &amp; black oak, above about 5200 ft. elev.; San Bernardino and San Jacinto Mtns (expected in San Gabrils).</td>
<td><strong>High.</strong> Suitable habitat present, known from vicinity.</td>
</tr>
</tbody>
</table>
Table 3.4-3. Special-Status Wildlife Potentially Occurring on the Project Site

<table>
<thead>
<tr>
<th>Species</th>
<th>Status</th>
<th>Habitat</th>
<th>Potential to Occur</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small-footed myotis</td>
<td>Fed: none, Calif: SA, S2S3</td>
<td>Much of W North America, wide elev. range; roost in caves, rock crevices, buildings, bridges; forage over water and in open woods; hibernate in winter.</td>
<td>High (foraging). Suitable foraging habitat present. Low (roosting). Marginally suitable roosting sites present.</td>
</tr>
<tr>
<td>Myotis ciliolabrum</td>
<td></td>
<td>Many habitats throughout Calif and W N Amer, scattered pop’ns in E; day roosts in caves, tunnels, mines; feed primarily on moths.</td>
<td>High (foraging). Suitable foraging habitat present. Minimal (roosting). No suitable roosting sites present.</td>
</tr>
<tr>
<td>(incl. all subspecies) Corynorhinus townsendii</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Western mastiff bat</td>
<td>Fed: none, Calif: SC</td>
<td>Patches of grass or ferns, historically from San Bernardino Mts, Running Springs and west, evidently now extinct.</td>
<td>Minimal. Believed extirpated or extinct.</td>
</tr>
<tr>
<td>Eumops perotis californicus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Perognathus alticulus alticulus</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yuma myotis</td>
<td>Fed: none, Calif: SA, S4?</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Myotis yumanensis</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: CDFW, 2015a; eBird, 2015.
Key to status codes at bottom of Table 3.4-2.

**Listed Threatened or Endangered Wildlife Species.** Federal- or state-listed threatened or endangered wildlife species were not observed on the Project site during the field survey. However, the bald eagle (*Haliaeetus leucocephalus*) has been documented at Lake Gregory (Lilburn, 2014; eBird, 2015). Southern rubber boa (*Charina umbratica*) is the only other listed species with potential to occur on the Project site. There is no designated critical habitat for any federally listed species on the Project site.

- **Southern Rubber Boa.** The southern rubber boa is a state-listed threatened species. It generally occurs in mesic (relatively moist) montane forests above about 5,000 feet elevation. The southern rubber boa is secretive and takes cover under rotting logs and other surface debris. It is mainly crepuscular (active at dawn and dusk) or nocturnal. During the cooler months, the southern rubber boa is inactive and remains in underground hibernacula, often located in rock outcrops. In the San Bernardino Mountains, most observations have been in the western part of the range around Lake Arrowhead and Running Springs and in the Barton Flats area. There are also a few records in the Big Bear Lake area. The CNDDB lists several occurrences of this species in the Harrison Mountain USGS topo quad (CDFW, 2015a). The boundary of this quad is within a mile of the Project site; however, the exact location of the occurrences has been suppressed to protect the species. The Biotic Resources Overlay maps in the San Bernardino County Development Code depict habitat for southern rubber boa throughout the surrounding area (County of San Bernardino Land Use Services, 2007). There is suitable habitat for southern rubber boa in the Project site, and it has a high potential to occur.

- **Bald Eagle.** The bald eagle is a state-listed endangered species and is protected under the BGEPA. It generally nests near large bodies of water or free flowing rivers with abundant fish for foraging and adjacent tall trees, snags, or rocks for perching. It primarily eats fish, but will also take birds, mammals, and carrion if available. Nests are usually located near a permanent water source and
placed in tall trees or on cliffs. Bald eagles roost communally in winter in dense, sheltered, remote conifer stands (Zeiner et al., 1990). Bald eagles have been documented at Lake Gregory (Lilburn, 2014; eBird, 2015) and there is suitable foraging habitat on the Project site. Aspen biologist Wood observed an adult bald eagle flying over the lake, perching in adjacent trees, and apparently feeding on prey on August 11, 2014. Bald eagles winter at many of the lakes in southern California, including lakes throughout the San Bernardino Mountains. Bald eagles have infrequently nested or attempted nesting in remote areas of the San Bernardino Mountains, including the Lake Silverwood watershed (Stephenson and Calcerone, 1999). It is unlikely that bald eagles would nest at or near the Project site due to proximity to human activities and lack of suitable large nesting trees. There is a moderate potential that they may nest in more remote areas in the Project vicinity and forage at Lake Gregory during the nesting season.

Southwestern Willow Flycatcher. There is no suitable habitat for southwestern willow flycatcher (Empidonax traillii extimus) on the Project site. The white alder groves on the dam and downstream from it form a mature gallery forest with very little understory. Recreational activities and vegetation management at an adjacent campground probably contribute to the open understory. The patches of arroyo willow scrub along the margins of Lake Gregory have very few trees, lack an understory, and are in close proximity to recreational activities which all make this habitat unsuitable for southwester willow flycatcher. In addition, protocol surveys were conducted for this species in potentially suitable habitat along the southwestern and southeastern portions of Lake Gregory (outside the Project site) in 2013. These surveys did not detect southwestern willow flycatcher, and concluded that the surveyed area did not provide suitable territorial or breeding habitat (Gonzales, 2013). Southwestern willow flycatcher is therefore not expected to be present on the Project site.

Other Special-status Wildlife Species. Special-status wildlife species were not observed on the Project site during the field survey. Seven California Species of Special Concern, one Fully Protected species, and two Special Animals have a moderate or high potential for occurrence. In addition, several special-status bats have potential for occurrence. There is suitable habitat for several additional special-status wildlife species on the site; however, their likelihood of occurrence is either low or minimal (see Table 3.4-3).

California Spotted Owl. The California spotted owl (Strix occidentalis occidentalis) is a CDFW Species of Special Concern. It nests in dense, shaded mature forests throughout portions of the San Bernardino Mountains, in mature forest stands with multi-layered canopies usually consisting of hardwoods and conifers (Stephenson and Calcerone, 1999). The nests are found in cavities or limbs of large trees. California spotted owl is a year-round resident (i.e., non-migratory) and feeds primarily on small mammals such as wood rats. The California spotted owl is not heat-tolerant and apparently requires shaded roost sites during summer. Foraging habitat is generally similar to breeding habitat, but may be more open (Davis and Gould, 2008). The Project site is within the Spotted Owl Habitat Overlay (Open Space Overlay 18) in the San Bernardino County Development Code (San Bernardino County Land Use Services, 2007). There is suitable foraging and nesting habitat in the Project vicinity. Nesting is unlikely on the Project site itself due to proximity to human activities and lack of suitable large nesting trees. However, California spotted owls may forage on the Project site, and has a high potential for occurrence there.

San Bernardino Flying Squirrel. The San Bernardino flying squirrel (Glaucomys sabrinus californicus) is a CDFW Species of Special Concern. It is found in conifer and hardwood forests from about 3,900 to 8,200 feet elevation, usually in mature forest stands dominated by black oak and white fir. It nests in tree cavities and also builds stick nests in trees. It eats acorns and other tree seeds, wild fruits, insects, fungi, and tree sap. It typically mates in early March with young being born between May and July (Wells-Gosling and Heany, 1984). The young typically leave the nest in two months (Wells-Gosling and
Heany, 1984). The San Bernardino flying squirrel is nocturnal and secretive, and therefore rarely seen. It occurs in low-density residential areas and organization camps, but may be absent from more densely developed areas (Stephenson and Calcerone, 1999). The Biotic Resources Overlay maps depict habitat for San Bernardino flying squirrel throughout the surrounding area (San Bernardino County Land Use Services, 2007). There is suitable foraging habitat, and perhaps nesting habitat, for San Bernardino flying squirrel on the Project site, and it has a high potential to occur there.

**Special-Status Bats.** Several special-status bat species (Townsend’s big-eared bat, hoary bat, long-eared myotis, fringed myotis, small-footed myotis, long-legged myotis, Yuma myotis, and western mastiff bat) have been documented within the San Bernardino National Forest (Miner and Stokes, 2005) and could use the site for foraging or roosting. Most sensitive bats roost primarily in caves, abandoned mine shafts, or old buildings. Others may roost in rock crevices or tree cavities, bark crevices, or foliage. Townsend’s big-eared bat is a California species of special concern and a candidate for state listing as threatened. The red bat and western mastiff bat are California species of special concern, while the other species are ranked as “special animals.” Occurrence potential for all special-status bats is addressed in Table 3.4-3.

**Other Species.** Other California Species of Special Concern with a moderate or high potential to occur on the Project site are San Bernardino Mountain kingsnake (*Lampropeltis zonata parvirubra*), silvery legless lizard (*Anniella pulchra pulchra*), two-striped garter snake (*Thamnophis hammondii*), yellow warbler (*Dendroica petechia brewsteri*), and American badger (*Taxidea taxus*). One Fully Protected species, the ringtail (*Bassariscus astutus*), and two Special Animals, Andrew’s marble butterfly (*Euchloe hyantis andrewsi*) and San Bernardino ringneck snake (*Diadophis punctatus modestus*), also have high potential for occurrence; see Table 3.4-3.

**Wildlife Movement**

The ability for wildlife to move freely among populations is important to long-term genetic variation and demography. Fragmentation and isolation of natural habitat may cause loss of native species diversity in fragmented habitats. In the short term, wildlife movement may also be important to individual animals’ ability to occupy their home ranges, if their ranges extend across a potential movement barrier. These considerations are especially important for rare, threatened, or endangered species, and wide-ranging species such as large mammals, which exist in low population densities.

The California Essential Habitat Connectivity Project was commissioned by the California Department of Transportation (Caltrans) and CDFW to create a statewide assessment of essential habitat connectivity to be used for conservation and infrastructure planning (Caltrans and CDFW, 2010). One of its goals was to create the Essential Connectivity Map, which depicts large, relatively natural habitat blocks that support native biodiversity (natural landscape blocks) and areas essential for ecological connectivity between them (essential connectivity areas). This map does not reflect the needs of particular species, but is based on overall biological connectivity and ecological integrity (Caltrans and CDFW, 2010).

The Essential Connectivity Map (Caltrans and CDFW, 2010) identifies the San Bernardino Mountains as a natural landscape block with essential connectivity areas in some of the more developed areas. This map does not provide a fine enough scale to identify the Project site, but it is within either a natural landscape block or, more likely, an essential connectivity area. At the local level, the Project site is not located within any wildlife corridors identified in the San Bernardino County Open Space Overlays (San Bernardino County Land Use Services, 2007).
Jurisdictional Waters and Wetlands

A reconnaissance-level survey of jurisdictional waters and wetlands was conducted by Aspen biologists on March 24, 2014. A similar survey of the borrow sites was conducted on April 3, 2015. Results of this survey indicate that stream channel and lake margin on the Project site appear to meet state and federal criteria as jurisdictional waters and wetlands. A small ephemeral drainage and associated riparian corridor are present to the east of the Thousand Pines stockpile area. There are three small ephemeral drainages within or adjacent to the Ponderosa East borrow site and one small drainage adjacent to the Ponderosa West borrow site. However, there has been no delineation of jurisdictional waters on the site.

3.4.2 Applicable Regulations, Plans, and Standards

The following are federal, state, and local laws, ordinances, regulations, and standards that apply to biological resources and jurisdictional waters and wetlands.

Federal Regulations

Endangered Species Act. The Endangered Species Act (ESA) (16 USC 1531 et seq.) establishes legal requirements for the conservation of endangered and threatened species and the ecosystems upon which they depend.

Section 9. Section 9 of the ESA lists those actions that are prohibited under the ESA, including take (i.e., to harass, harm, pursue, hunt, wound, or kill) of listed species without special exemption. “Harm” is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or shelter. “Harass” is further defined as actions that create the likelihood of injury to listed species to an extent as to significantly disrupt normal behavior patterns which include breeding, feeding, and shelter.

Section 10. Section 10 allows for the "incidental take" of endangered and threatened species by non-Federal entities. Incidental take is defined by the ESA as take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity." Section 10 requires an applicant for an incidental take permit to submit a habitat conservation plan that specifies, among other things, the impacts that are likely to result from the taking and the measures the applicant will undertake to minimize and mitigate such impacts.

Critical Habitat. Designation of an area as critical habitat provides a means by which the habitat of an endangered or threatened species can be protected from adverse changes or destruction resulting from federal activities or projects. A critical habitat designation does not set up a preserve or refuge and usually applies only when federal funding, permits, or projects are involved.

Clean Water Act. The Clean Water Act (33 USC 1251 et seq.) establishes legal requirements for the restoration and maintenance of the chemical, physical, and biological integrity of the nation’s waters.

Section 401. Section 401 requires that an applicant for a federal license or permit that allows activities resulting in a discharge to waters of the United States must obtain a State certification that the discharge complies with other provisions of the Clean Water Act. The Regional Water Quality Control Boards (RWQCBs) administer the certification program in California.
Section 404. Section 404 establishes a permit program administered by the U.S. Army Corps of Engineers (USACE) regulating the discharge of dredged or fill material into waters of the United States, including wetlands. Implementing regulations by the USACE are found at 33 CFR Parts 320-330. Guidelines for implementation are referred to as the Section 404(b)(1) Guidelines and were developed by the EPA in conjunction with the USACE (40 CFR Parts 230). The Guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Migratory Bird Treaty Act. The Migratory Bird Treaty Act (MBTA) (16 USC 703-711) is a treaty signed by the United States, Canada, Mexico, and Japan that prohibits take of any migratory bird, including eggs or active nests, except as permitted by regulation (e.g., hunting waterfowl or upland game species). Under the MBTA, “migratory bird” is broadly defined as “any species or family of birds that live, reproduce or migrate within or across international borders at some point during their annual life cycle” and thus applies to most native bird species.

Bald and Golden Eagle Protection Act. The BGEPA (16 USC, 668, enacted by 54 Stat. 250) protects bald and golden eagles by prohibiting the taking, possession, and commerce of such birds and establishes civil penalties for violation of this act. Under BGEPA, take includes “disturb,” which means “to agitate or bother a bald eagle or a golden eagle to a degree that causes, or is likely to cause, based on the best scientific information available, (1) injury to an eagle, (2) a decrease in its productivity, by substantially interfering with normal breeding, feeding, or sheltering behavior, or (3) nest abandonment, by substantially interfering with normal breeding, feeding, or sheltering behavior.”


State Laws and Regulations

California Endangered Species Act. The California Endangered Species Act (CESA) (Fish and Game Code 2050 et seq.) establishes the policy of the state to conserve, protect, restore, and enhance threatened or endangered species and their habitats. CESA mandates that state agencies not approve projects that would jeopardize the continued existence of threatened or endangered species if reasonable and prudent alternatives are available that would avoid jeopardy. For projects that affect a species listed under both CESA and the federal ESA, compliance with the federal ESA will satisfy CESA if CDFW determines that the federal incidental take authorization is consistent with CESA under Fish and Game Code Section 2080.1. For projects that will result in take of a species listed under CESA but not under the federal ESA, the applicant must apply for a take permit under Section 2081(b).

Fully Protected Designations – California Fish and Game Code Sections 3511, 4700, 5515, and 5050. Prior to enactment of CESA and the federal ESA, California enacted laws to “fully protect” designated wildlife species from take, including hunting, harvesting, and other activities. Unlike the subsequent CESA and ESA, there was no provision for authorized take of designated fully protected species. Currently, 36 fish and wildlife species are designated as fully protected in California, including golden eagle.

California Senate Bill 618 (signed by Governor Brown in October 2011) authorizes take of fully protected species, where pursuant to a Natural Conservation Community Plan, approved by CDFW. The legislation
gives fully protected species the same level of protection as is provided under the Natural Community Conservation Planning Act for endangered and threatened species (see below).

Native Birds – California Fish and Game Code Sections 3503 and 3513. California Fish and Game Code Section 3503 prohibits take, possession, or needless destruction of bird nests or eggs except as otherwise provided by the Code; Section 3503.5 prohibits take or possession of birds of prey or their eggs except as otherwise provided by the Code; and Section 3513 provides for the adoption of the MBTA’s provisions (above). With the exception of a few non-native birds such as European starling, the take of any birds or loss of active bird nests or young is regulated by these statutes. Most of these species have no other special conservation status as defined above. The administering agency for these sections is the CDFW. As with the MBTA, these statutes offer no statutory or regulatory mechanism for obtaining an incidental take permit for the loss of non-game migratory birds.

Streambed Alteration Agreements – California Fish and Game Code Sections 1600-1616. Under these sections of the Fish and Game Code, an applicant is required to notify CDFW prior to constructing a project that would divert, obstruct, or change the natural flow, bed, channel, or bank of a river, stream, or lake. Preliminary notification and project review generally occur during the environmental review process. When a fish or wildlife resource may be substantially adversely affected, CDFW is required to propose reasonable project changes to protect the resource. These modifications are formalized in a Streambed Alteration Agreement that becomes part of the plans, specifications, and bid documents for the project. CDFW jurisdiction is determined to occur within the water body of any natural river, stream, or lake. The term “stream,” which includes creeks and rivers, is defined in Title 14, CCR, Section 1.72.

Surface Mining and Reclamation Act. The California Surface Mining and Reclamation Act (SMARA) regulates surface mining to assure that adverse environmental impacts are minimized and mined lands are reclaimed to a usable condition. SMARA regulations require that surface mine operations prepare and implement a reclamation plan, which is administered by the local land use jurisdiction. The reclamation plan specifies measures (e.g., revegetation) to achieve a post-mining land use. Operators must provide a bond to cover reclamation costs, pending reclamation completion.

Regional and Local Regulations

County of San Bernardino Development Code

The San Bernardino County Development Code implements the goals and policies of the General Plan by regulating land uses within the unincorporated areas of the County. Overlay maps depict areas subject to various county policies. The Biotic Resources Overlay implements General Plan policies regarding the protection and conservation of beneficial rare and endangered plants and animal resources and their habitats.

The Biotic Resources Overlay maps depict habitat for southern rubber boa and San Bernardino flying squirrel throughout the local area. The Project site is also within the California Spotted Owl Habitat Overlay (Open Space Overlay 18). This area includes mature forest that provides habitat suitable for California spotted owl, generally in and around Jobs Peak, Cedarpines Park, Valley of Enchantment, Crestline, and Lake Gregory. The policy states that habitat areas for the California spotted owl and other species should be maintained.

For projects within the Biotic Resources and Open Space Overlay areas, Chapter 82.11 and 82.19 of the Development Code require that for proposed new land uses, or increases of existing land use by more than 25 percent of disturbed area, the land use application shall include a biological resources report, along with mitigation measures to reduce or eliminate impacts to the identified resources. The
Development Code also states that the County’s Conditions of Approval for the project shall incorporate the mitigation measures from the biological report.

Chapter 88.01 of the Development Code regulates vegetation removal, including permitting, mitigation, and treatment of felled trees. A Tree or Plant Removal Permit is required for the removal of regulated trees and plants. In the Project vicinity, regulated trees and plants are living, native trees with a stem diameter of six inches or greater or stem circumference of 19 inches or greater, measured at 4.5 feet above natural grade level; riparian vegetation within 200 feet of the bank of a stream; and oak woodlands. Conditions of Approval may include replacement, restoration, or in-lieu mitigation for impacts.

Section 88.01.090 details regulations for treatment and disposal of felled trees to protect against damaging insects (e.g., bark beetles) and diseases. This section applies to coniferous trees and lists several methods for treating felled trees, and at least one of these methods must be employed within 15 days after a tree is cut. There are several other requirements in the section, including the treatment of cut stumps with borax powder within two hours of cutting to protect against annosus root rot (*Fomes annosus*).

**Crest Forest Community Plan**

The Project site is within the boundaries of the Crest Forest Community Plan. This Plan includes the following Conservation Goal and Policies applicable to biological resources on the Project site:

**Goal CF/CO 1. Preserve the unique environmental features of Crest Forest including native wildlife, vegetation, and scenic vistas.**

   - Policy CF/CO 1.2 – Continue to identify and protect unique habitats supporting rare and endangered species by applying the Biotic Resources Overlay.
   - Policy CF/CO 1.3 – The following areas are recognized as important open space areas that provide for wildlife movement and other important linkage values. Projects shall be designed to minimize impacts to these corridors: A. Spotted Owl Habitat Open Space Area.

**Environmental Commitments**

Several Environmental Commitments (ECs) have been developed by the San Bernardino County Special Districts Department (County) and are incorporated into the proposed Project Description to minimize potential effects to biological resources. All Project-related activity will be subject to the ECs. All the ECs are described in Section 2.5 (Environmental Commitments). Table 3.4-4 lists those that are designed to minimize or avoid potential impacts to biological resources.

<table>
<thead>
<tr>
<th>Environmental Commitment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>EC-1.</strong> No vehicles will be operated in Houston Creek.</td>
</tr>
<tr>
<td><strong>EC-3.</strong> Vehicle speeds will remain below 10 mph on unpaved roads to minimize dust and reduce wildlife impacts.</td>
</tr>
<tr>
<td><strong>EC-4.</strong> Vegetation will be removed from the dam outside of the bird breeding season (March-August).</td>
</tr>
<tr>
<td><strong>EC-6.</strong> The County shall present an environmental-education program to all personnel assigned to the Project. The program will describe sensitive resources and associated minimization measures, Environmental Commitments, adopted mitigation measures from the Final EIR, environmental laws and regulations, permits, and all other agency requirements.</td>
</tr>
</tbody>
</table>
3.4.3 Environmental Impacts and Mitigation Measures

This section evaluates the Project’s potential direct and indirect effects to biological resources and describes feasible mitigation measures to reduce these impacts to less-than-significant levels. The impact analysis is based on the biological resources described above and on the proposed Project description in Section 2.

A significant impact is defined under CEQA as “a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project” (CEQA Guidelines Section 15382). The CEQA Guidelines define direct impacts as those impacts that result from the project and occur at the same time and place. Indirect impacts are caused by the project, but can occur later in time or farther removed in distance and are still reasonably foreseeable and related to the operation of the project.

The significance criteria listed below are from the Environmental Checklist form in Appendix G of the CEQA guidelines. They are used to determine whether the proposed Project would result in significant impacts to biological resources. Impacts would be significant if the Project would:

- **BIO-1**: Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;
- **BIO-2**: Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS;
- **BIO-3**: Have a substantial adverse effect on federally protected wetlands as defined by Section 404, of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- **BIO-4**: Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites; or
- **BIO-5**: Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

The following threshold from the CEQA Appendix G Environmental Checklist is not relevant to the proposed Project and is not discussed further beyond the summary below:

- **IV (f)** Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

The Project site is not located within any adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP area. The Project would not conflict with such plan and no impact would occur related to CEQA Threshold IV (f).

**Impact BIO-1**: The Project would result in the loss or degradation of native vegetation, habitat, and sensitive natural communities and jurisdictional areas (Less than Significant with Mitigation)

Construction of the earthen buttress, excavation of material from the borrow sites, and temporary road and utility relocation would require the removal of native vegetation, including sensitive natural communities. Table 3.4-5 quantifies the temporary and permanent impacts to vegetation and land cover. Figure 3.4-1 shows the locations of temporary and permanent impacts at the dam, and each borrow site would comprise 1.5 acres of permanent disturbance.
Table 3.4-5. Temporary and Permanent Impacts in the Proposed Project Area

<table>
<thead>
<tr>
<th>Vegetation Communities and Cover Types</th>
<th>Temporary Impact Area</th>
<th>Permanent Impact Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>White fir–sugar pine forest</td>
<td>0.90</td>
<td>3.76*</td>
</tr>
<tr>
<td>White alder groves</td>
<td>0.15</td>
<td>0.64</td>
</tr>
<tr>
<td>Arroyo willow thickets</td>
<td>0.15</td>
<td>--</td>
</tr>
<tr>
<td>Annual brome grasslands</td>
<td>0.26</td>
<td>0.22</td>
</tr>
<tr>
<td>Open water</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Developed</td>
<td>2.52</td>
<td>0.01</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.98</strong></td>
<td><strong>4.63</strong></td>
</tr>
</tbody>
</table>

*Includes estimated permanent impact of 1.5 acres each for the two borrow sites.

Sensitive natural communities on the Project site are white alder groves and arroyo willow thickets. These sensitive natural communities would be directly affected by removal of vegetation or by trampling or crushing during construction activities. Indirect impacts to vegetation could result from alterations in existing topography and hydrology, sedimentation and erosion, soil compaction, accumulation of fugitive dust (which could impact plant photosynthesis and respiration), exposure to hazardous substances accidentally released by vehicles or other equipment, disruptions to seed banks from ground disturbance, or the colonization of non-native, invasive plant species. Absent mitigation, these impacts would be significant. Project operation and maintenance would not cause further significant effects to sensitive vegetation.

The Project would temporarily adjust the lake level as may be required for construction, but aquatic habitat within the lake would not be disturbed. The flow of lake water to Houston Creek, which supports riparian vegetation, may fluctuate with construction needs. The County currently adjusts the lake level and flow of water to Houston Creek for various reasons as part of operations and maintenance, and Project effects are expected to be similar to existing conditions.

Seepage through the current dam buttress also supports downstream vegetation. The Project would redirect this seepage past the new buttress by installation of a drainage system. The vegetation that would be affected by this alteration in water flow is within the footprint of the new buttress, and therefore there would be no additional Project impacts as a result of changes in seepage.

Reconnaissance-level field surveys indicate that state and federal jurisdictional waters and wetlands may be present on the Project site. Project construction would affect these features, if present, as described above for sensitive native vegetation. Absent mitigation, these impacts would be significant. Projects affecting waters of the State or waters of the U.S. are subject to permitting under the California Fish and Game Code and federal Clean Water Act (CWA). Each project applicant must prepare and submit appropriate applications, notifications, and fees to the USACE (according to Section 404 of the CWA), the CDFW (according to Sections 1600-1616 of the California Fish and Game Code), and the RWQCB (according to Section 401 of the CWA). Federal CWA permitting is required for projects that would place dredged or fill material into jurisdictional waters of the U.S., and State authorization is required if projects would 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.

Prior to the start of construction, the County would be required to obtain permits or agreements from the USACE, RWQCB, and CDFW for Project-related impacts to jurisdictional areas. The County would be required to implement all conditions required by the permits and agreements as issued by the resource agencies. The County’s notification or application to the three agencies would be required to include a jurisdictional delineation report, based on current agency delineation methods and jurisdictional criteria.

As described in Section 3.8 (Hydrology and Water Quality), existing regulations require that the Project obtain a Construction General Permit. The General Permit requires a Storm Water Pollution Prevention Plan (SWPPP) prepared by a qualified SWPPP developer. The SWPPP must list Best Management Practices (BMPs) that will be used to protect storm water runoff and the placement of those BMPs. Additionally, the SWPPP must contain a visual monitoring program; a chemical monitoring program for "non-visible" pollutants to be implemented if there is a failure of BMPs; and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

Environmental Commitments include prohibiting vehicles in Houston Creek, maintaining vehicle speeds below 10 mph on unpaved roads, and training workers about sensitive biological resources (see Table 3.4-4). However, with implementation of the Environmental Commitments, there would still be impacts to native vegetation, wildlife habitat, and jurisdictional areas.

Mitigation Measure BIO-1 would require the County to implement Best Management Practices to minimize impacts to jurisdictional areas. Mitigation Measure BIO-2 would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible. Mitigation Measures BIO-3, BIO-4, and AQ-1 would require the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction and spread of invasive weeds, and control fugitive dust. Mitigation Measure HAZ-1 requires any herbicide use be performed by a licensed herbicide applicator in a manner that minimizes risk to wildlife and non-target vegetation. Mitigation Measure HAZ-3 requires all fueling, hazardous materials storage areas, and operation and maintenance activities involving hazardous materials be sited at least 100 feet from blue-line drainages. Additionally, compliance with SWPPP requirements would minimize impacts from stormwater runoff. Implementation of these measures would reduce impacts to native vegetation, habitat, and sensitive natural communities and jurisdictional areas to less than significant.

**Mitigation Measures**

**MM BIO-1 Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas.**

The County will implement all mitigation measures and conditions contained within the Streambed Alteration Agreement obtained from CDFW for impacts to jurisdictional areas, as well as any requirements of the RWQCB or USACE, upon determination of jurisdiction and permit issuance by all three agencies. In addition, the following Best Management Practices will be implemented during all construction activity in or near drainages, waters, and wetlands:

1. Vehicles and equipment will not operate in ponded or flowing water except as described in the Streambed Alteration Agreement.
2. The County will minimize construction activities and vegetation clearing within drainages to the extent feasible.

3. The County will prevent water containing mud, silt, or other pollutants from grading or other activities to enter drainages or be placed in locations that may be subjected to high storm flows.

4. Spoil sites will not be located within 30 feet from the boundaries of drainages or in locations that may be subjected to high storm flows, where spoils might be washed back into drainages.

5. Raw cement/concrete or washings thereof, asphalt, paint or other coating material, oil or other petroleum products, or any other substances that could be hazardous to vegetation or wildlife resources, resulting from Project-related activities, will not be allowed to contaminate soil or enter drainages.

6. When construction activities are completed, any excess materials or debris will be removed from the work area. No rubbish will be deposited within 150 feet of the ordinary high water mark (OHWM) of any drainage during construction of the Project.

7. No equipment maintenance will occur outside of developed areas within 150 feet of any streambed and no petroleum products or other pollutants from the equipment will be allowed to enter these areas or enter any off-site state-jurisdictional waters under any flow.

8. The installation of bridges, culverts, or other structures will be such that water flow (velocity and low flow channel width) is not impaired. Bottoms of temporary culverts will be placed at or below stream channel grade.

MM BIO-2 Pre-construction Surveys and Construction Monitoring. The County will assign one or more qualified biological monitors to the Project to monitor Project construction activities and conduct pre-construction surveys. Monitors will be responsible for ensuring that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible. Monitors will also inform on-site construction personnel and County representatives of applicable Project mitigation measures, environmental commitments, and permit conditions, and any potential for infraction.

A biological monitor will be present during initial site clearing activities (vegetation clearing, soil preparation, ground disturbance, and removal of rock reinforcement) and during installation of exclusion fencing (if any), and at appropriate intervals throughout construction to ensure compliance with regulatory terms and conditions. In addition, a monitor will conduct clearance surveys for sensitive plant or wildlife resources and active bird nests within or adjacent to the Project area within seven (7) calendar days prior to each of these activities. If any sensitive resources are found, the biological monitor will take appropriate action as defined in all adopted mitigation measures, environmental commitments, and permit conditions.

Monitoring and survey activities will be documented and, at the conclusion of Project construction activities, all monitoring reports and communications will be retained in Project files to allow review by permitting agencies if requested.
MM BIO-3 **Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss.** The County will minimize impacts and permanent loss of all native vegetation, including white alder groves and arroyo willow thickets, and native vegetation that provides habitat for special-status plants and wildlife, at construction sites by flagging areas to be avoided, as feasible.

**On-site Restoration.** If sensitive vegetation or habitat that may support special-status plants or animals is removed for temporary Project impacts (e.g., temporary equipment staging areas), the County will prepare and implement an Ecological Restoration Plan, to establish native vegetation cover on all temporary impact areas within five (5) years of initial disturbance. The Ecological Restoration Plan’s goal will be to restore native vegetation that will ultimately replace habitat values that are damaged or degraded by the Project. The plan will include: (a) quantitative description of habitat to be removed, including vegetation cover (by tree, shrub, and herb components), native species richness, and density of dominant species; (b) soil or substrate preparation measures, such as recontouring, decompacting, or imprinting; (c) provisions for soil or substrate salvage and storage; (d) plant material collection and acquisition guidelines, including guidelines for salvaging, storing, and handling seed, cuttings, or rooted plants from the Project site, as well as obtaining materials from commercial nurseries or collecting from outside the Project area; (e) time of year that the planting or seeding will occur and the methodology of the planting; (f) an irrigation plan or alternate measures to ensure adequate water; (g) quantitative success criteria, to reflect yearly progress and final completion; (h) a detailed monitoring program to evaluate conformance with the success criteria; and (i) contingency measures to remediate the restoration site if success criteria are not met.

In addition to the dam construction site, the Ecological Restoration Plan will apply to borrow sites where any native habitat is affected. Due to applicability of the California Surface Mining and Reclamation Act to the borrow sites, the County will include the Ecological Restoration Plan in its Mining and Reclamation Plan, and identify the appropriate bonding amount, for review by the County Land Use Service Department and California Office of Mine Reclamation.

**Compensation.** If sensitive vegetation or habitat that may support special-status species would be removed for long-term or permanent Project impacts (i.e., native vegetation that will ultimately replace lost habitat values cannot be established within five (5) years from initial disturbance), the County will provide for long-term habitat replacement by protecting compensation land that will provide habitat value equivalent or greater than habitat removed for the Project. Compensation may include off-site habitat restoration or other habitat improvements as needed, to replace habitat components affected by the Project. In addition, the County will provide for long-term conservation management of the compensation land. The County will prepare a Mitigation Plan, identifying the proposed compensation lands, proposed habitat improvements and long-term management, and specific legal mechanism for long-term preservation (e.g., holder of conservation easement or fee title). The Compensation Plan may be subject to review and approval by USACE, RWQCB, or CDFW according to each agency’s applicable permit conditions (if any). The Compensation Plan will be implemented in full.
MM BIO-4  **Prevent Invasive Weed Introduction.** Precautions will be taken to prevent the introduction of any invasive weeds. Construction equipment will be cleaned of mud or other potential sources of weed seeds before it arrives at the Project sites. Any reclamation or erosion control seeding will consist of native species, native seed mix, or other ecologically appropriate, non-invasive plants. Only weed-free straw or mulch will be used.

MM AQ-1  **Fugitive Dust Control.** See full text of measure in Section 3-3 (Air Quality and Greenhouse Gas Emissions).

MM HAZ-1  **Licensed Herbicide Applicator.** See full text of measure in Section 3-7 (Hazards and Hazardous Materials).

MM HAZ-3  **Siting of Hazardous Materials.** See full text of measure in Section 3-7 (Hazards and Hazardous Materials).

**Impact BIO-2:** The Project would adversely affect plants and wildlife, including candidate, sensitive, or special-status species (Less than Significant with Mitigation)

**Common Plants and Wildlife**

Vegetation and habitat removal for buttress site preparation and borrow site excavation would cause displacement or mortality of native plants and most wildlife on the site. Animals would generally leave, or attempt to leave, during equipment operation. Many small mammals and reptiles, as well as nesting birds or eggs, could be crushed by the equipment. Other effects of the Project could cause disturbance from fugitive dust, noise, and vibration, entrapment in construction materials or excavations, exposure to hazardous substances accidentally released by vehicles or other equipment, and displacement, injury, or mortality from Project-related construction activities. Trash, particularly food trash, left in the work areas may affect wildlife by attracting potential predators, such as common ravens and domestic dogs.

Mortality and displacement for most common plants and animals would be adverse but less than significant according to CEQA. Displacement or mortality of special-status species may meet CEQA criteria as a significant impact, depending on the extent of take and local population conditions. Native birds, nests, and nestlings are generally protected under the Migratory Bird Treaty Act and California Fish and Game Code, regardless of other conservation designations. Thus, mortality of nesting birds (including eggs or nestlings), regardless of other conservation status designations, may violate state and federal regulations.

Environmental Commitments include prohibiting vehicles in Houston Creek, maintaining vehicle speeds below 10 mph on unpaved roads to minimize dust and reduce wildlife impacts, removing vegetation outside of bird breeding season, and training workers about sensitive biological resources (see Table 3.4-4). However, with implementation of the Environmental Commitments, there would still be impacts to common plants and wildlife.

Mitigation Measures BIO-2 (Pre-construction Surveys and Construction Monitoring) and BIO-5 (Nest and Den Avoidance) would require the County to identify nests through pre-construction surveys and avoid take of active bird nests, either through scheduling of Project activities outside the nesting season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting birds prior to vegetation and habitat removal. With implementation of BIO-2 and BIO-5, adverse effects to nesting and migratory birds would be minimized. In addition, Mitigation Measure BIO-6 (Avoid Wildlife Hazards and Entrapment) would require the County to minimize hazards to wildlife by avoiding
Mitigation Measure BIO-7 (Avoid Nocturnal Wildlife) would require the County to carry out Project-related construction activities during daylight hours to minimize impacts to nocturnal wildlife. Implementation of mitigation measures would reduce impacts to common plants and wildlife, including nesting birds, to less than significant.

**Special-Status Plants**

There are no listed threatened or endangered plants or plants that are proposed or candidates for state or federal listing on the Project site. In addition, there is no suitable habitat for listed, proposed, or candidate plants on the Project site or adjacent areas. The Project would not affect listed, proposed, or candidate plant species.

One special-status plant, Parish’s alumroot (CRPR 1B), is present within the Project site, near an access road south of Camp Switzerland, but no special status plants were located within expected work areas. One additional special-status plant ranked as CRPR 1B, southern jewelflower, may be present in low numbers on the buttress site and the borrow sites. Suitable habitat for other special-status plants ranked as CRPR 4 is present on the buttress site and the borrow sites and one or more of these species may occur there. The Project would not take or remove Parish’s alumroot, but may cause accumulation of fugitive dust (which could impact plant photosynthesis and respiration), exposure to hazardous substances accidentally released by vehicles or other equipment, or the colonization of non-native, invasive plant species. If other special-status plants are present within the Project site they could be directly affected by removal of vegetation or by trampling or crushing during construction, as well as indirect impacts from dust, hazardous materials, or invasive species.

These impacts, should they occur, would not be substantial for Parish’s alumroot, southern jewelflower, or special-status plants ranking CRPR 4 due to the low numbers of plants occurring (or potentially occurring) on the buttress site and borrow sites and their conservation status as rare or watch-list species, but not listed under the CESA or ESA.

Project Environmental Commitments require the County to ensure that vehicle speeds remain below 10 mph on unpaved roads to minimize dust and also to provide training to Project workers on sensitive biological resources (see Table 3.4-4). However, with implementation of the Environmental Commitments, there would still be potential impacts to special-status plants.

Mitigation Measure BIO-2 (Pre-construction Surveys and Construction Monitoring) would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible. Mitigation Measure BIO-3 (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-4 (Prevent Invasive Weed Introduction), and AQ-1 (Fugitive Dust Control) would further reduce any potential impacts to special-status plants by identifying and avoiding any occurrences in the Project area to the extent feasible, restoring or compensating for impacts to habitat, controlling fugitive dust, and minimizing the potential for weed introductions or spread. Implementation of these mitigation measures would reduce impacts to special-status plants to less than significant.

**Special-Status Wildlife**

The Project site may provide foraging, roosting, sheltering, or nesting habitat for Andrew’s marble butterfly, San Bernardino Mountain kingsnake, San Bernardino ringneck snake, silvery legless lizard, southern rubber boa, two-striped garter snake, bald eagle (wintering/foraging), California spotted owl,
yellow warbler, American badger, ringtail, and San Bernardino flying squirrel. Construction activities at the Project site could affect these species and their habitat.

Special-status wildlife may be affected by temporary or permanent loss or modification of habitat, disturbance from fugitive dust, noise, and vibration, entrapment in construction materials or excavations, exposure to hazardous substances accidentally released by vehicles or other equipment, and displacement, injury, or mortality from Project-related construction activities. Absent mitigation, these impacts would be significant according to CEQA.

Environmental Commitments include prohibiting vehicles in Houston Creek, maintaining vehicle speeds below 10 mph on unpaved roads to minimize dust and reduce wildlife impacts, removing vegetation outside of bird breeding season, and training workers about sensitive biological resources (see Table 3.4-4). However, with implementation of the Environmental Commitments, there would still be potential impacts to special-status wildlife.

**Listed Species**

**Southern Rubber Boa.** The southern rubber boa is a state-listed threatened species protected under CESA. The Project site is shown as southern rubber boa habitat in the San Bernardino Development Code Biological Resource Overlay, and a reconnaissance-level field survey confirmed that the site includes habitat suitable for the southern rubber boa, primarily on the existing dam face. The Ponderosa East borrow site has suitable habitat for the rubber boa, but the Ponderosa West borrow site does not. If southern rubber boa is present within the Project site, it may be affected by temporary or permanent loss or modification of habitat, disturbance from fugitive dust, noise, and vibration, entrapment in construction materials or excavations, exposure to hazardous substances accidentally released by vehicles or other equipment, and injury or morality from Project-related construction activities, particularly during removal of the existing rock from the face of the dam. Absent mitigation, these impacts would be significant according to CEQA.

Prior to initiation of Project-related activities within suitable habitat for southern rubber boa, the County would be required to consult with CDFW to obtain applicable take authorization or to identify additional avoidance or mitigation measures that may be necessary to avoid take. The County would be required to implement all terms or conditions of such authorization and to comply with any additional avoidance or mitigation measures that are identified.

Environmental Commitments include maintaining vehicle speeds below 10 mph on unpaved roads and training workers about sensitive biological resources. However, rubber boas in habitat near the dam or on the borrow sites could be disturbed or injured by vegetation removal and heavy equipment operation or other Project-related activities. Therefore, Mitigation Measure BIO-2 (Pre-construction Surveys and Construction Monitoring) would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible.

Mitigation Measure BIO-6 (Avoid Wildlife Hazards and Entrapment) would require the County to avoid creating entrapment hazards for wildlife and prohibit vehicle traffic outside of designated work areas and access roads. Mitigation Measure BIO-8 (Manage Project Trash) would require the County to contain Project-related trash and remove it from the work area daily. Mitigation Measure BIO-3 (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-4 (Prevent Invasive Weed Introduction), and AQ-1 (Fugitive Dust Control) would further minimize impacts by requiring the County
to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, and control fugitive dust.

Mitigation Measure BIO-9 (Minimization and Avoidance Measures for Southern Rubber Boa) requires the County to conduct clearance surveys for southern rubber boa immediately prior to initial ground disturbance, install exclusion fencing around work areas, and monitor initial vegetation removal and site preparation. This mitigation measure also requires that any southern rubber boa found on the Project site will be relocated off the site by a qualified and permitted biologist, and in accordance with take authorization from CDFW as applicable. This will avoid take of southern rubber boa by locating and removing animals from work areas and preventing animals from entering work areas. In combination with the measures listed above, MM BIO-9 would avoid take and minimize or offset adverse impacts to southern rubber boa. With implementation of these measures, impacts of construction and operation of the proposed Project would be less than significant.

**Bald Eagle.** The bald eagle is a state-listed endangered species protected under CESA and BGEPA. This species is regularly seen foraging on fish at Lake Gregory, but has a low potential to nest on the Project site. The bald eagle may be affected by temporary or permanent loss or modification of habitat; disturbance from fugitive dust, noise, and vibration; entrapment in construction materials or excavations; exposure to hazardous substances accidentally released by vehicles or other equipment; and injury or mortality from Project-related construction activities. Absent mitigation, these impacts would be significant according to CEQA.

Environmental Commitments include maintaining vehicle speeds below 10 mph on unpaved roads, removing vegetation from the dam outside of the bird nesting season, and training workers about sensitive biological resources. However, bald eagles foraging or roosting near the dam may be disturbed or injured by Project-related activities. Therefore, Mitigation Measure BIO-2 (Pre-construction Surveys and Construction Monitoring) would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible.

Mitigation Measure BIO-5 (Nest and Den Avoidance) would require the County to identify nests through pre-construction surveys and avoid take of active bird nests, either through scheduling of Project activities outside the nesting season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting birds prior to vegetation and habitat removal. Mitigation Measure BIO-6 (Avoid Wildlife Hazards and Entrapment) would require the County to avoid creating entrapment hazards for wildlife and prohibit vehicle traffic outside of designated work areas and access roads. Mitigation Measure BIO-3 (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-4 (Prevent Invasive Weed Introduction), and AQ-1 (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, and control fugitive dust. With implementation of these mitigation measures, potential adverse effects would be avoided or minimized. Implementation of these measures would reduce impacts to bald eagle to less than significant.

**Other Special-Status Species**

**Andrew’s Marble Butterfly.** The Andrew’s marble butterfly is a CDFW Special Animal. Larval food plants for this species may be present in the vicinity of the Project site and it has a high potential for occurrence. This species may be affected by temporary or permanent loss or modification of habitat, including loss of larval food plants, disturbance from fugitive dust, noise, and vibration, entrapment in
construction materials or excavations, exposure to hazardous substances accidentally released by vehicles or other equipment, and injury or mortality from Project-related construction activities. Absent mitigation, these impacts would be significant under CEQA.

Environmental Commitments include maintaining vehicle speeds below 10 mph on unpaved roads and training workers about sensitive biological resources. However, marble butterflies and their habitat, including larval food plants, could be damaged or destroyed by vegetation removal and heavy equipment operation or other Project-related activities. Therefore, Mitigation Measure BIO-2 (Pre-construction Surveys and Construction Monitoring) would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible, including minimizing impacts to larval food plants.

Mitigation Measure BIO-3 (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-4 (Prevent Invasive Weed Introduction), and AQ-1 (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, and control fugitive dust. With implementation of these mitigation measures, potential adverse effects would be avoided or minimized. Implementation of these measures would reduce impacts to Andrew’s marble butterfly to less than significant.

**Special-Status Reptiles.** Several non-listed, special-status reptiles potentially occur in the Project area. These include the San Bernardino Mountain kingsnake (state Species of Special Concern), the San Bernardino ringneck snake (CDFW Special Animal), silvery legless lizard (state Species of Special Concern), and two-striped garter snake (state Species of Special Concern). Suitable habitat for these species is present in the Project area and they each have a high potential for occurrence. Special-status reptiles may be affected by temporary or permanent loss or modification of habitat, disturbance from fugitive dust, noise, and vibration, entrapment in construction materials or excavations, exposure to hazardous substances accidentally released by vehicles or other equipment, and injury or morality from Project-related construction activities. Absent mitigation, these impacts would be significant according to CEQA.

Environmental Commitments include maintaining vehicle speeds below 10 mph on unpaved roads and training workers about sensitive biological resources. However, snakes and lizards in habitat near the dam or on the borrow sites could be disturbed or injured by vegetation removal and heavy equipment operation or other Project-related activities. Therefore, Mitigation Measure BIO-2 (Pre-construction Surveys and Construction Monitoring) would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible, including moving animals out of harm’s way.

Mitigation Measure BIO-6 (Avoid Wildlife Hazards and Entrapment) would require the County to avoid creating entrapment hazards for wildlife and prohibit vehicle traffic outside of designated work areas and access roads. Mitigation Measure BIO-8 (Manage Project Trash) would require the County to contain Project-related trash and remove it from the work area daily. Mitigation Measure BIO-3 (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-4 (Prevent Invasive Weed Introduction), and AQ-1 (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, and control fugitive dust. With implementation of these mitigation measures, these potential adverse effects would be avoided or minimized. Implementation of these measures would reduce impacts to special-status reptiles to less than significant.
California Spotted Owl. The California spotted owl is a state Species of Special Concern. The buttress area and borrow sites are mapped as California spotted owl habitat in the San Bernardino Development Code Open Space Overlay (Open Space Overlay 18). These areas include mature forest that provides habitat suitable for the California spotted owl. A biological reconnaissance survey confirmed that the areas include habitat suitable for California spotted owl foraging. The buttress area is unlikely to support nesting spotted owls due to proximity to human activities, but the borrow sites are more secluded and may be used for nesting. California spotted owl may be affected by temporary or permanent loss or modification of habitat, disturbance from fugitive dust, noise, and vibration, exposure to hazardous substances accidentally released by vehicles or other equipment, loss of or damage to nests and injury or mortality to eggs and chicks during vegetation clearing, and injury or morality from Project-related construction activities. Absent mitigation, these impacts would be significant according to CEQA.

Environmental Commitments include maintaining vehicle speeds below 10 mph on unpaved roads, removing vegetation from the dam outside of the bird nesting season, and training workers about sensitive biological resources. However, spotted owls nesting in trees near the dam may be disturbed by Project activities, and owls at or near borrow sites could be disturbed or injured by vegetation removal and heavy equipment operation or other Project-related activities. Therefore, Mitigation Measure BIO-2 (Pre-construction Surveys and Construction Monitoring) would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible.

Mitigation Measure BIO-5 (Nest and Den Avoidance) would require the County to identify nests through pre-construction surveys and avoid take of active bird nests, either through scheduling of Project activities outside the nesting season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting birds prior to vegetation and habitat removal. Mitigation Measure BIO-7 (Avoid Nocturnal Wildlife) would require the County to carry out Project-related construction activities during daylight hours to minimize impacts to nocturnal wildlife, including spotted owls. Mitigation Measure BIO-8 (Manage Project Trash) would require the County to contain Project-related trash and remove it from the work area daily. Mitigation Measure BIO-3 (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-4 (Prevent Invasive Weed Introduction), and AQ-1 (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, and control fugitive dust. With implementation of these mitigation measures, potential adverse effects would be avoided or minimized. Implementation of these measures would reduce impacts to California spotted owl to less than significant.

Yellow Warbler. The yellow warbler is a state Species of Special Concern. Suitable habitat for this species is present on the Project site and it has a high potential for occurrence. This species may be affected by temporary or permanent loss or modification of habitat; disturbance from fugitive dust, noise, and vibration; exposure to hazardous substances accidentally released by vehicles or other equipment; and injury or morality from Project-related construction activities. Absent mitigation, these impacts would be significant according to CEQA.

Environmental Commitments include maintaining vehicle speeds below 10 mph on unpaved roads, removing vegetation from the dam outside of the bird nesting season, and training workers about sensitive biological resources. However, yellow warblers nesting in riparian vegetation near the dam or near the borrow sites could be disturbed or injured by vegetation removal and heavy equipment operation or other Project-related activities. Therefore, Mitigation Measure BIO-2 (Pre-construction
Surveys and Construction Monitoring) would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible.

Mitigation Measure BIO-5 (Nest and Den Avoidance) would require the County to identify nests through pre-construction surveys and avoid take of active bird nests, either through scheduling of Project activities outside the nesting season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting birds prior to vegetation and habitat removal. Mitigation Measure BIO-3 (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-4 (Prevent Invasive Weed Introduction), and AQ-1 (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, and control fugitive dust. With implementation of these mitigation measures, potential adverse effects would be avoided or minimized. Implementation of these measures would reduce impacts to yellow warbler to less than significant.

American Badger. The American badger is a state Species of Special Concern. Suitable habitat for this species is present in the Project area and it has a moderate potential for occurrence. This species may be affected by temporary or permanent loss or modification of habitat; disturbance from fugitive dust, noise, and vibration; entrapment in construction materials or excavations; exposure to hazardous substances accidentally released by vehicles or other equipment; and injury or mortality from Project-related construction activities. Absent mitigation, these impacts would be significant according to CEQA.

Environmental Commitments include maintaining vehicle speeds below 10 mph on unpaved roads and training workers about sensitive biological resources. However, badgers denning in habitat near the dam or on the borrow sites could be disturbed or injured by vegetation removal and heavy equipment operation or other Project-related activities. Therefore, Mitigation Measure BIO-2 (Pre-construction Surveys and Construction Monitoring) would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible.

Mitigation Measure BIO-5 (Nest and Den Avoidance) would require the County to identify wildlife nests and dens through pre-construction surveys and avoid take of active nests and dens, either through scheduling of Project activities outside the nesting/denning season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting or denning wildlife prior to vegetation and habitat removal. Mitigation Measure BIO-6 (Avoid Wildlife Hazards and Entrapment) would require the County to avoid creating entrapment hazards for wildlife and prohibit vehicle traffic outside of designated work areas and access roads. Mitigation Measure BIO-7 (Avoid Nocturnal Wildlife) would require the County to carry out Project-related construction activities during daylight hours to minimize impacts to nocturnal wildlife. Mitigation Measure BIO-8 (Manage Project Trash) would require the County to contain Project-related trash and remove it from the work area daily. Mitigation Measure BIO-3 (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-4 (Prevent Invasive Weed Introduction), and AQ-1 (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, and control fugitive dust. With implementation of these mitigation measures, potential adverse effects would be avoided or minimized. Implementation of these measures would reduce impacts to American badger to less than significant.
Ringtail. The ringtail is a state Fully Protected species. Suitable habitat for this species is present in the Project area and it has a moderate potential for occurrence. This species may be affected by temporary or permanent loss or modification of habitat; disturbance from fugitive dust, noise, and vibration; entrapment in construction materials or excavations; exposure to hazardous substances accidentally released by vehicles or other equipment; and injury or morality from Project-related construction activities. Absent mitigation, these impacts would be significant according to CEQA.

Environmental Commitments include maintaining vehicle speeds below 10 mph on unpaved roads and training workers about sensitive biological resources. However, ringtails denning in habitat near the dam or on the borrow sites could be disturbed or injured by vegetation removal and heavy equipment operation or other Project-related activities. Therefore, Mitigation Measure BIO-2 (Pre-construction Surveys and Construction Monitoring) would require the County to have a qualified biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible.

Mitigation Measure BIO-5 (Nest and Den Avoidance) would require the County to identify wildlife nests and dens through pre-construction surveys and avoid take of active nests and dens, either through scheduling of Project activities outside the nesting/denning season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting or denning wildlife prior to vegetation and habitat removal. Mitigation Measure BIO-6 (Avoid Wildlife Hazards and Entrapment) would require the County to avoid creating entrapment hazards for wildlife and prohibit vehicle traffic outside of designated work areas and access roads. Mitigation Measure BIO-7 (Avoid Nocturnal Wildlife) would require the County to carry out Project-related construction activities during daylight hours to minimize impacts to nocturnal wildlife. Mitigation Measure BIO-8 (Manage Project Trash) would require the County to contain Project-related trash and remove it from the work area daily. Mitigation Measure BIO-3 (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-4 (Prevent Invasive Weed Introduction), and AQ-1 (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, and control fugitive dust. With implementation of these mitigation measures, many of these potential adverse effects would be avoided or minimized. Implementation of these measures would reduce impacts to ringtail to less than significant.

San Bernardino Flying Squirrel. The San Bernardino flying squirrel is a state Species of Special Concern. The buttress area and borrow sites are mapped as San Bernardino flying squirrel habitat in the San Bernardino Development Code Biological Resources Overlay. These areas include mature forest that provides habitat suitable for the San Bernardino flying squirrel. A biological reconnaissance survey confirmed that the buttress area and borrow sites include habitat suitable for the San Bernardino flying squirrel. San Bernardino flying squirrel may be affected by temporary or permanent loss or modification of habitat; disturbance from fugitive dust, noise, and vibration; entrapment in construction materials or excavations; exposure to hazardous substances accidentally released by vehicles or other equipment; and injury or morality from Project-related construction activities. Absent mitigation, these impacts would be significant according to CEQA.

Environmental Commitments include maintaining vehicle speeds below 10 mph on unpaved roads and training workers about sensitive biological resources. However, flying squirrels nesting or sheltering in trees near the dam or on the borrow sites could be disturbed or injured by vegetation removal and heavy equipment operation or other Project-related activities. Therefore, Mitigation Measure BIO-2 (Pre-construction Surveys and Construction Monitoring) would require the County to have a qualified
biological monitor conduct pre-construction surveys and monitor construction to ensure that impacts to special-status species, native vegetation, wildlife habitat, and sensitive or unique biological resources are avoided to the extent possible.

Mitigation Measure BIO-5 (Nest and Den Avoidance) would require the County to identify wildlife nests and dens through pre-construction surveys and avoid take of active nests and dens, either through scheduling of Project activities outside the nesting/denning season or through pre-construction clearance surveys and implementation of no-disturbance buffers for nesting or denning wildlife prior to vegetation and habitat removal. Mitigation Measure BIO-6 (Avoid Wildlife Hazards and Entrapment) would require the County to avoid creating entrapment hazards for wildlife and prohibit vehicle traffic outside of designated work areas and access roads. Mitigation Measure BIO-7 (Avoid Nocturnal Wildlife) would require the County to carry out Project-related construction activities during daylight hours to minimize impacts to nocturnal wildlife. Mitigation Measure BIO-8 (Manage Project Trash) would require the County to contain Project-related trash and remove it from the work area daily. Mitigation Measure BIO-3 (Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss), BIO-4 (Prevent Invasive Weed Introduction), and AQ-1 (Fugitive Dust Control) would further minimize impacts by requiring the County to minimize loss of native vegetation and compensate for habitat loss, prevent the introduction of invasive weeds, and control fugitive dust. With implementation of these mitigation measures, potential adverse effects would be avoided or minimized. Implementation of these measures would reduce impacts to San Bernardino flying squirrel to less than significant.

Mitigation Measures

**MM BIO-1** Implement Best Management Practices to Minimize Impacts to Jurisdictional Areas

**MM BIO-2** Pre-construction Surveys and Construction Monitoring

**MM BIO-3** Minimize Impacts to Sensitive Habitat and Compensate for Habitat Loss

**MM BIO-4** Prevent Invasive Weed Introduction

**MM BIO-5** Nest and Den Avoidance. If pre-construction surveys identify an active bird nest or other active denning or nesting wildlife within or adjacent to Project disturbance areas, the County will reschedule vegetation removal activities and delineate a no-disturbance buffer area around the nest or den site. The extent of the buffer area will be determined by the biological monitor, based on the nature of proposed Project activities, the animal’s tolerance to disturbance (if known), and conservation status of the affected species.

Habitat removal taking place outside the nesting season for birds will not necessitate pre-construction nest surveys. Nesting season is generally February through August, but can vary depending on environmental factors. The biological monitor will determine if nesting activity is occurring either prior to or after the February-through-August period and nesting surveys will be performed accordingly.

Breeding season for the San Bernardino flying squirrel is not well known and reproduction can potentially occur year-round (Brylski, 1998). Therefore, pre-construction surveys for denning or nesting mammals and reptiles, and implementation of disturbance-free buffers as needed, will be conducted year-round.

**MM BIO-6** Avoid Wildlife Hazards and Entrapment. The County will ensure that all potential wildlife pitfalls (trenches, bores, and other excavations) have been backfilled or securely
covered at the end of each workday. If backfilling or covering is not feasible, these potential pitfalls will be sloped at a 3:1 ratio at the ends as wildlife escape ramps. Project workers or construction monitors will inspect all potential pits daily.

All pipes or other construction materials or supplies will be covered or capped in storage or laydown areas. No pipes or tubing will be left open either temporarily or permanently, except during use or installation. Any construction pipe, culvert, or other hollow materials will be inspected for wildlife before it is moved, buried, or capped. Should wildlife become trapped in excavations, materials, or other Project-related situation, the biological monitor will remove it (if feasible and safe) or immediately contact CDFW. Any wildlife encountered will be moved out of harm’s way by the biological monitor, or will be allowed to leave the area unharmed.

Project-related vehicle access, construction activities, and equipment storage will be restricted to established roads, designated access roads, construction rights-of-way, and designated construction, storage, staging, and parking areas. Off-road traffic outside of these designated areas will be prohibited.

**MM BIO-7 Avoid Nocturnal Wildlife.** All Project-related construction activities will be carried out during daylight hours to minimize adverse effects to foraging or other activities for California spotted owl, San Bernardino flying squirrel, southern rubber boa, special-status bats, and other nocturnal wildlife.

**MM BIO-8 Manage Project Trash.** Trash, especially food items or packaging, will be kept inside vehicles or in self-closing containers and removed from work areas daily.

**MM BIO-9 Minimization and Avoidance Measures for Southern Rubber Boa.** The County will implement the following measures to minimize or avoid potential impacts to southern rubber boa:

- A qualified biologist will conduct clearance surveys for southern rubber boa on the face of the dam immediately prior to any vegetation or rock removal, and at each borrow site location immediately prior to initial ground disturbance.
- Exclusion fencing appropriate for snakes will be installed around all suitable habitat for southern rubber boa within the Project disturbance area footprint to ensure no southern rubber boas enter the work site. A biological monitor will be on site during fence installation and will conduct clearance surveys of the fence locations prior to installation. The fencing will remain in place for the duration of construction and the biological monitor will periodically inspect the fence for damage. Any damage found will be reported to the County or the County’s construction contractor for immediate repair.
- A qualified and permitted biologist will monitor initial vegetation removal and site preparation at the face of the dam and the borrow sites, including removal of rock reinforcement from the face of the dam, and will immediately halt work if a southern rubber boa is discovered in the work area. The biologist will move the animal out of harm’s way, in accordance with the terms and conditions of the incidental take permit, and will notify the County and CDFW within one working day.
- In the event that a southern rubber boa is found on the Project site, the qualified and permitted biologist will immediately halt construction work and will relocate the
animal off the Project site in accordance with the terms and conditions of the incidental take permit. Details regarding the sighting will be recorded and provided to the County and CDFW within 24 hours. Construction activities may resume when the animal is out of harm’s way and the biologist has cleared the work area.

- If a dead or injured southern rubber boa is found on the Project site, the biologist will immediately contact CDFW for guidance.

**MM AQ-1 Fugitive Dust Control.** See full text of measure in Section 3-3 (Air Quality and Greenhouse Gas Emissions).

**Impact BIO-3: The Project could interfere with wildlife movement (Less than Significant)**

According to the California Essential Connectivity Map (Caltrans and CDFW, 2010), the Project site is within either a natural landscape block or an essential connectivity area. At the local level, the Project site is not located within any wildlife corridors identified in the San Bernardino County Open Space Overlays (San Bernardino County Land Use Services, 2007). Given the relatively small size of Project disturbance areas, the limited timeline for Project construction activities, minimal long-term land use change, and the opportunities for wildlife movement in the surrounding landscape, the Project would have a less-than-significant impact on wildlife movement or the use of wildlife nursery sites, and no mitigation is proposed.

**Impact BIO-4: The Project could conflict with local policies or ordinances protecting biological resources (Less than Significant)**

The San Bernardino County Development Code includes policies regarding the protection and conservation of rare and endangered plants and animal resources and their habitats. It also includes regulations and guidelines for the management of plant resources in the unincorporated areas of the County. Additionally, the Crest Forest Community Plan has policies to protect native wildlife and vegetation, and maintain the health and vigor of the forest environment; see Subsection 3.4.2 (Applicable Regulations, Plans, and Standards).

Prior to construction, the County would be required to review the San Bernardino County Development Code and Crest Forest Community Plan (as needed) and consult with the County Land Use Services County or other applicable County division (as needed) to ensure that the Project complies with local policies and ordinances protecting biological resources.

Unless the Project is determined to be exempt, prior to construction the County would be required obtain a Tree or Plant Removal Permit (Permit) in compliance with Section 88.01.050 of the San Bernardino County Development Code and comply with all Conditions of Approval included in the Permit.

The County would also be required to comply with Section 88.01.090 of the San Bernardino County Development Code regarding treatment of felled trees and stumps of coniferous species, including the application of borax powder (granular tech, 10 mole) to cut stumps within two hours of felling to protect from infection by annosus root rot. Borax powder will be applied in compliance with all applicable federal and state regulations.

The County would comply with all applicable requirements of the San Bernardino County Development Code and Crest Forest Community Plan. Implementation of Environmental Commitments (see Table 3.4-4) and mitigation measures recommended above would minimize potential conflict with local policies or ordinances protecting biological resources, and impacts would be less than significant.
3.4.4 Level of Significance after Mitigation

The Project does not conflict with any HCPs or NCCPs and would have no impact related to such plans. Compliance with applicable regulations would avoid any conflict with local policies or ordinances protecting biological resources, resulting in a less-than-significant impact. The Project would have a less-than-significant impact on wildlife movement and the use of wildlife nursery sites. All other impacts would be reduced to less-than-significant with implementation of mitigation measures.
3.5 Cultural and Paleontological Resources

Cultural resources can reflect the history, diversity, and culture of the region and people who created them. They are unique in that they are often the only remaining evidence of activity that occurred in the past. Cultural resources can be natural or built, purposeful or accidental, physical or intangible. They encompass archaeological, traditional, and built environment resources, including but not necessarily limited to buildings, structures, objects, districts, and sites. Cultural resources include sites of important events, traditional cultural places and sacred sites, and places associated with an important person. Many cultural resources are present in the San Bernardino Mountains that could be affected by development without adequate protections in place.

Paleontological resources, or fossils, are the evidence of once-living organisms preserved in the geologic record. They include both the fossilized remains of ancient plants and animals and the traces thereof (e.g., track ways, imprints, burrows, etc.). In general, fossils are greater than 5,000 years old (middle Holocene) and are typically preserved in sedimentary rocks. Although rare, fossils can also be preserved in volcanic rocks and low-grade metamorphic rocks under certain conditions (SVP, 2010).

This section considers and evaluates the potential impacts of the proposed Project on cultural and paleontological resources. It is primarily based on two documents produced in support of this EIR: Cultural Resources Assessment for the Lake Gregory Dam Rehabilitation Project, San Bernardino County, California (Keeler et al., 2015; see Appendix 4a) and Paleontological Technical Memorandum for the Lake Gregory Dam Rehabilitation Project, San Bernardino County, California (Richards et al., 2015; see Appendix 4b).

3.5.1 Environmental Setting

3.5.1.1 Cultural Resources

Methods

To comply with applicable regulations, plans, and standards (see Section 3.5.2), cultural resources specialists conducted a cultural resources study consisting of a detailed records search and an intensive pedestrian survey. These studies were done in support of the EIR and the County’s compliance with the California Environmental Quality Act (CEQA).

Records Search and Archival Research

An inventory of previous reports, records, and other documents was performed for the area encompassing a one-mile radius surrounding the portion of the Project area containing the Lake Gregory Dam. This inventory was performed in August 2014 at the San Bernardino Archaeological Information Center. A second record search was conducted for the Thousand Pines stockpile area and the Ponderosa East and Ponderosa West borrow areas in May 2015 at the South Central Coastal Information Center, where cultural resources records for San Bernardino County had subsequently been moved. A total of 40 cultural resources were found within this area, including 2 prehistoric sites, 2 prehistoric isolates, 19 historic period archaeological sites, and 17 historic period built environment resources. None of these resources are located in the Project area. Based on these results, the general Project area is not considered to be sensitive for containing prehistoric and historical archaeological deposits in subsurface contexts.
A request for relevant information was sent to two local historical societies, the Big Bear Valley Historical Society and the Rim of the World Historical Society, in May 2015. However, to date, no response has been received from either group.

Additionally, searches of the Sacred Lands File were requested from the Native American Heritage Commission (NAHC) in August 2014 and May 2015. The search results were negative for known areas of concern or cultural importance to California Native Americans.

**Pedestrian Survey**

Cultural resources surveys of the Project area were conducted in September 2014 and April 2015. The surveyed area covered the full extent of the Project area. The surveys consisted of archaeologists walking in parallel transects spaced at approximately 15-meter intervals over the Project area while closely inspecting the ground surface. Additionally, an architectural historian inspected and evaluated the dam. The total area surveyed was approximately 28 acres, with 18 acres conducted at the Lake Gregory Dam Survey area, 2.6 acres at the Ponderosa West borrow area, 3.9 acres at the Ponderosa East borrow area, and 1.7 acres at the Thousand Pines stockpile area.

**Native American Consultation**

The NAHC Contacts database has the names and contact information for individuals, representing a group or themselves, who have expressed an interest in being contacted about development projects in specified areas. It is standard to request information from the NAHC on the presence of sacred lands in the vicinity of a proposed project and also request a list of Native Americans to whom inquiries would be made to identify both additional cultural resources and any concerns the Native Americans may have about a Project. San Bernardino County regularly provides information and sends notices of all public events regarding projects to all Native American groups and individuals whom the NAHC identifies as having an interest in development in the area, whether federally recognized or not.

In August 2014 and May 2015, searches were requested of the NAHC Contacts database for a list of Native American groups and individuals who have been identified as having an interest in being contacted about development projects in the general Project area. Contact information for seven potentially interested parties was provided and in August and September 2014 and May 2015, letters and emails were sent inviting them to consult on the Project and requesting information about any areas that may be of cultural concern to them near the Project area. A response was received from Daniel McCarthy of the San Manuel Band of Mission Indians on May 27, 2015 requesting information on the level of previous disturbance around the additional borrow sites and a copy of the study results. Also on May 27, 2015, Andy Salas of the Gabrielleño Band of Mission Indians-Kizh Nation requested a digital copy of the original consultation letter. As of June 2015, no other responses have been received.

**Cultural Resources Categories**

Four broad types of cultural resources are considered in this EIR: prehistoric archaeological resources, historic period archaeological resources, built-environmental resources, and ethnographic resources.

**Prehistoric archaeological resources** are places that Native Americans lived, performed activities, altered the environment, and created art before sustained contact with Europeans began in the 1770s. Prehistoric resources contain features left behind by these activities as well as artifacts and subsistence remains. Additionally, they may contain human remains in the form of burials, cairns, or cremations.
**Historic period archaeological resources** are places where people lived, performed activities, altered the environment, and created art between 1769 AD and 50 years before the present. Like prehistoric archaeological resources, historic period archaeological resources often occur where people lived, but also include the remains of industrial, agricultural, recreational, and waste management activities. These can be surface features, subsurface features, or the remains of activities, including debris scatters.

**Built-environment resources** were constructed at least 50 years before the present. The most obvious are historic-era buildings, but also include structures, such as bridges and dams, and objects, such as monuments and signs.

**Ethnographic resources** are those places that have importance within a particular culture or are tied to important historical events. Generally these places are of importance to people in the present. They may also represent events in local, state, or national history; be tied to particular people; or relate to the mythology and traditions of particular cultures. One type of ethnographic resource is the Traditional Cultural Property (TCP). TCPs are most commonly associated with Native American cultures but also include areas important to other social groups, such as minority ethnicities.

**Cultural Resources Setting**

**Prehistoric Context**

The prehistory of the Project vicinity is divided generally into four archaeological patterns: the Paleoindian/Paleocoastal Pattern, the San Dieguito Pattern, the Greven Knoll Pattern, and the Peninsula Pattern (Arnold and Walsh, 2010; Sutton, 2011). The Greven Knoll and Peninsula patterns are subdivided into three phases each (Sutton and Gardner, 2010; Sutton, 2011).

Prior to about 10,000 years before present (BP), little is known about the inhabitants of the Project vicinity. To the north and east, around the large, precipitation-filled lakes in the interior deserts, Paleoindian Pattern groups used large fluted projectile points, indicating they hunted extinct megafauna such as mastodons, as well as using the resources of these lakes. The Paleocoastal Pattern was present along the coast. These people used specialized tools for producing canoes, as well as stemmed projectile points and were focused on marine resources such as sea mammals, shellfish, fish, and birds (Arnold and Walsh, 2010; Sutton and Gardner, 2010; Sutton, 2011). No resources related to either pattern are known in the vicinity surrounding the Project area.

The San Dieguito Pattern (10,000 to 8,500 BP) appeared around 10,000 BP and was focused on using estuary, lakeshore, and river resources, including shellfish and birds. There is limited evidence for milling equipment that would indicate a major role of seeds or nuts in the diet. This population likely came to the region from the interior deserts as the large lakes there dried up (Arnold and Walsh, 2010; Sutton and Gardner, 2010). No resources related to either pattern are known in the vicinity surrounding the Project area.

The Greven Knoll Pattern, related to the wider Encinitas Tradition, was the dominant way of life for inhabitants of the Project vicinity from 8,500 to 900 BP. Cultural resources associated with the Greven Knoll Pattern tend to be in inland valleys. Greven Knoll Pattern people processed seeds, nuts, and other plant foods using handstones and millingslabs and did not switch to using mortars and pestles like coastal populations did around 5,000 BP. This may reflect a close relationship with desert groups who did eat acorns. The population density during this period was likely low. Greven Knoll Pattern people spoke unknown languages that likely were part of the Hokan language family, perhaps related to modern Yuman languages. The pattern is divided into three phases: Greven Knoll I, II, and III (Sutton and Gardner, 2010).
In Phase I (8,500 to 4,000 BP) typical characteristic artifacts included the use of Pinto projectile points for throwing spears/atlatl darts, charmstones, and stones carved to resemble gears (cogged stones). Graven Knoll I sites do not contain shell artifacts, indicating that they did not use the coastal regions. People were buried in a flexed position. The Phase I people appear to have been very influenced by Pinto Pattern people from the Mojave Desert. In Phase II (4,000 to 3,000 BP), the way of life seems to have not dramatically changed from that of Phase I. Important changes included an increase in milling tools and a decrease in projectile points. This, along with the use of lithic core tools, indicates that gathering plant resources became more important. Elko projectile points mostly replaced Pinto points for throwing spears/atlatl darts. There is little evidence for contact with the coastal regions. In Phase III (3,000 to 900 BP), new types of both flaked and ground stone tools began to be used, including scraper planes, choppers, and hammerstones. Projectile points are rare in Phase III sites. Yucca and small seeds became staple foods and animal bones were heavily processed (broken and crushed to extract marrow). By this time, flexed burials were marked with rock cairns, and cremations were occasionally practiced (Sutton and Gardner, 2010).

By 900 BP, the Greven Knoll Pattern was replaced by a new cultural tradition related to the influx of speakers of Takic languages from the coast or from extinct Lake Cahuilla in Coachella and Imperial valleys. This new way of life is called the Peninsular Pattern. Early Peninsular sites tend to be near sources of freshwater in valleys, although some of these areas have now become desert. Lake Cahuilla formed periodically over the last several thousand years when the Colorado River broke its channel into the Gulf of Mexico and flowed into the Salton Sea Basin, forming a large, deep body of fresh water. The most recent occurrence of this, around 1,070 BP, created a rich freshwater lake environment that drew people from the coastal areas to use the plant and animal resources. People then moved from the shores of the lake into the San Bernardino Mountains, bringing their culture with them, called Peninsular I Phase. The Peninsular Pattern then evolved into the Peninsular II and Peninsular III Phases. The Peninsular Pattern was the way of life encountered by Europeans when they arrived in the region (Sutton and Gardner, 2010; Sutton, 2011).

There were crucial changes between the Peninsular I Phase (900 to 750 BP) and the prior Greven Knoll Phase III. These included the introduction of bow and arrow technology, Patayan-style pottery, and the replacement of flat milling equipment with bedrock mortars, indicating reliance on acorns as a staple food. Other changes include increased use of lake resources, increased use of shell ornaments, mortuary cremations, and new decoy, trap, and net technologies for hunting and fishing. During the Peninsular I Phase (750 to 300 BP) people began to be cremated and their remains buried in ceramic containers. Brown Ware pottery became the dominant ceramic style and ceramic pipes and figurines appear in the archaeological record. The Peninsular III Phase (300 to 150 BP) was essentially the same as the prior phases except with the introduction of European and Euro-American artifacts (e.g., glass trade beads) and limited agricultural techniques. This is the culture that was encountered by the Spanish missionaries at the beginning of the historic period (Sutton and Gardner, 2010).

**Ethnographic Context**

At the time of sustained European contact, western San Bernardino County was occupied by three linguistically related groups: the Serrano, Cahuilla, and Gabrieleño. These groups spoke languages belonging to the Takic branch of the Uto-Aztecan language family. The Project area falls in the southern portion of the traditional territory of the Serrano. The Serrano population at the time of European contact was approximately 2,500 people who were scattered over a rugged, expansive landscape from the San Bernardino Mountains east to Mount San Gorgonio, the San Gabriel Mountains west to Mount San Antonio, portions of the Mojave Desert to the north, and the fringe of the San Bernardino Valley to the...
south. The Serrano had extensive cultural contacts with the Cahuilla to the east and the Gabrieleño westward to the Pacific coast. The close proximity of Serrano territory to the prehistoric Cocopa-Maricopa Trail that linked the Colorado Desert with the Pacific Coast likely led to many other interactions with surrounding tribes.

Serrano clans were politically autonomous, although they were linked by ceremonial ties to other clans and groups. These clans lived in villages at the valley margins in the winter and in smaller encampments at higher elevations in the summer. Individual dwellings were scattered across the landscape, to the extent that some villages covered up to five square miles. Serrano residences were circular, domed, willow-and-tule thatch structures. Important villages had large ceremonial houses and semi-subterranean sweathouses. In addition to occupation sites and food procurement sites, rock cairns along trails, petroglyph and pictograph sites, hot springs, lithic material quarries, and trails represent important land uses.

The Serrano gathered and stored acorns, pine nuts, and mesquite beans to eat over the winter, and also ate a variety of fruits, seeds, and greens. Hunting was important to the diet, especially community-wide rabbit hunts. Serrano technology was very similar to neighboring cultural groups, particularly the Cahuilla. They used bows and arrows to hunt large game and curved throwing sticks, traps, snares, and nets to obtain smaller game and birds. The Serrano used mortars and pestles and other milling equipment to process plant foods. Other tools included stone knives, scrapers, pottery trays and bowls, baskets, and horn or bone spoons.

Although the Spanish began establishing missions in California in AD 1769, people occupying the vicinity surrounding the Project were at the edge of European influence until the mid-1800s. Mission San Gabriel Arcángel, roughly 50 miles to the west, was established in 1771. When an outpost of this mission, the San Bernardino de Sena Estancia, was established in 1819 near Redlands about 14 miles from the Project area, the Spanish forced many of the Serrano into the mission system, while others continued to raid mission and rancho lands. Like most Native Californian communities, Serrano populations declined dramatically as they were decimated by epidemic diseases and missionization in the late 18th and early 19th centuries and then by the tremendous influx of American settlers in the mid-19th and 20th centuries. Today, however, two Serrano communities persist and are federally recognized sovereign tribal nations. The closest, the San Manuel Band of Mission Indians, possess a reservation located approximately six miles to the southeast of the Project area. The other is the Morongo Band of Mission Indians located in Banning. Other groups, such as the San Fernando Band of Mission Indians and the Serrano Nation of Mission Indians, are listed on the NAHC Contacts database as Native American groups who have been identified as having an interest in being contacted about development projects in specified areas.

### Historical Context

The **Spanish Period** (AD 1769 to 1821) began with Gaspar de Portolà’s expeditions in 1769. Spanish expansion along his route brought missionaries and soldiers to establish a chain of missions and forts. Mission San Gabriel Arcángel was fourth in the chain, located at the crossroads of El Camino Real and trails from Mexico and Santa Fe. Pueblo de Nuestra Señora de los Angeles de Porciúncula was established nearby as a secular town. While land grants were given out by the Spanish Crown in other parts of California, western San Bernardino County remained under the control of Mission San Gabriel. In 1819, the San Bernardino de Sena Estancia was established as a ranch outpost at the eastern edge of the mission lands.

During the **Mexican Period** (AD 1821 to 1848), independence from Spain in 1821 ended the ban on foreign trade in California. This brought merchants and immigrants to the area, and whaling and ranching became...
important industries in Southern California. After 1834, plots of land were carved out of the mission lands and sold to individuals, creating five ranchos in San Bernardino County. Rancho Muscupiabe was granted to Michael White in 1843. This was the closest rancho to Lake Gregory and was located at the base of the San Bernardino Mountains to the south and west of the Project area.

**American Period** (AD 1848 to present) began with the end of the Mexican-American War and the ceding of California to the United States. The rush to California’s gold was fully underway by 1849. The southern route to reach California passed through Santa Fe and Salt Lake City, and followed the Old Spanish Trail crossing the Mojave Desert and entering the southern California valleys through Cajon Pass west of the Project area. Miners sought gold in the San Bernardino Mountains and established small mine holdings along creeks and in the hills. As mining communities became established, logging became an industry to provide wood for buildings and mines. The earliest known logging operation in the area was Crismons Mill, near to where Crestline is situated today. It was established in 1853, the same year that San Bernardino was split off from Los Angeles County. On the southern slopes of the San Bernardino Mountains, additional roads began to penetrate the area. A road was built up Devils Canyon in 1870, leading to an influx of recreational visitors to the upper elevations in the 1880s. Vacationers and campers set up tents in the meadows along Houston Creek. The mountains became so popular that President Benjamin Harrison created the San Bernardino National Forest Preserve in 1891.

In 1890, Arthur Gregory of Redlands bought timber land and established a mill in the area of Houston Creek. Gregory and a business partner, A.G. Hamilton of Fontana, subdivided Gregory’s logged-out land just east of Houston Flats, primarily for vacation cabins and tourist-related housing. Improvements to the main road to the community of Crestline, the Rim of the World Drive, were completed in 1930. This allowed greater numbers of recreational visitors to drive directly to the area. The Crest Forest County Water District partnered with the Works Progress Administration (WPA) to dam Houston Creek and form a reservoir. Gregory invested half of the funds for the dam and reservoir that would bear his name. The Civilian Conservation Corps (CCC) built the dam and reservoir between 1935 and 1938.

**Identified Cultural Resources**

During the cultural resources survey of the Project area, three cultural resources were identified. One is a prehistoric isolate while the other two are historic-era built-environment resources.

The prehistoric isolate consists of a bedrock outcrop that contains a single possible mortar cup. This is located in the within the Ponderosa East borrow area. Isolates are not considered eligible for listing on the California Register and generally need no further consideration other than recording of its existence. However, this may indicate the presence of additional, unidentified prehistoric artifacts, features, or deposits within the immediate vicinity and thus the area surrounding it should be considered as having a high potential for encountering cultural resources.

The first of the two historic-era built-environment resources is an agricultural complex centered around a remnant apple orchard within the Thousand Pines stockpile area. Within the stockpile area, an estimated 10 to 15 apple trees still survive. Associated with the trees are two metal silos, a concrete block pump or well house, a small concrete foundation, a plywood box, and several dirt roads. Based on historic-era aerial photographs of the Project area, the trees are part of orchards that have been cultivated here since at least 1938. This orchard appears on aerial photographs taken in 1938, 1952, 1966, and 1968. The associated structures may or may not be as old as the trees themselves. Several of the features and structures inside and outside the Thousand Pines Stockpile area appear to be related in time and function, as part of the maintenance of an apple orchard that dates to the 1930s. The pump house, the orchard itself, and the silos appear to be part of the original use of the site as an orchard. The wood and metal
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3. ENVIRONMENTAL SETTING, ANALYSIS, AND MITIGATION MEASURES

box, concrete foundation, and scattered wood and metal debris may be related to the orchard or may relate to more recent use of the area as a campground. The small cinderblock structure, tentatively identified as a pumphouse, is the type of utilitarian construction that could date to any time within the past 70 years, based on its style and materials.

This orchard complex does not appear to be associated with events or persons important in national, state, or local history, and thus is not significant under California Register criteria 1 or 2. The constituent features, including structures and the orchard itself, do not appear to be extraordinary examples of a type or of master workmanship, and therefore, are not significant under California Register Criterion 3. As the interior contents of the cinderblock structure and the wood box are not currently known, they have the potential to yield information important in regional history (Criterion 4), but this is a low probability. The orchard complex appears to retain its aspects of integrity, including location, design, setting, materials, workmanship, feeling, and association. It is recommended that the portions of this resource within the Thousand Pines stockpile area are not eligible for listing on the California Register and thus do not need to be considered as a historical resource. However, the chance exists that additional information from the portions of the resource outside of the Project area could lead to it being considered eligible for listing on the California Register.

The second historic-era built-environment resource identified is the Lake Gregory Dam itself. Completed in 1938, this structure measures approximately 110 feet tall and is constructed of earthen fill with rock fill added on the downstream slope. The top of the dam was widened and a bridge constructed over the spillway in 1941 to accommodate Lake Drive. The Lake Gregory Dam was constructed by crews of the CCC under a WPA grant issued to the Crestline Water District.

The Lake Gregory Dam has stood relatively unchanged since it was completed in 1938 and has retained its aspects of integrity including location, design, setting, materials, workmanship, feeling, and association. The Lake Gregory Dam was evaluated as an engineering structure associated with the creation of a freshwater reservoir and flood control structure located in the San Bernardino Mountains. Although its integrity is intact, field and archival analysis indicate that the Lake Gregory Dam does not appear eligible for listing in the California Register of Historical Resources (California Register) as a significant historical resource under any of the four criteria (see Section 3.5.2 for details on the California Register and listing criteria).

The Lake Gregory Dam does not appear to qualify as a significant resource under Criterion 1, association with significant historical events that exemplify broad patterns of history. It is not a significant example of the projects completed by the WPA either in California or the United States, nor did it play a significant role in the history of the retention or diversion of water in San Bernardino County, or in California. The structure also does not appear to qualify as a significant resource under Criterion 2, association with persons of historical importance. Research has not revealed any direct association between the Lake Gregory Dam and persons important to either regional or national history. Lake Gregory Dam does not appear to qualify as a significant resource under Criterion 3, distinctive characteristics of a type, period, region, or method of construction. The technology used to construct the Lake Gregory Dam was based on known engineering practices and application. The Lake Gregory Dam is a simple, earthen embankment dam and does not have sufficient engineering merit of design, materials, and workmanship, to be considered a structure that represents the dam-building technology of the 1930s. Finally, the Lake Gregory Dam does not appear to qualify as a significant resource under Criterion 4, potential to yield information important to the understanding of history. The methods of construction are well established and it does not likely contain any details or archaeological deposits that would provide such information.
While no cultural resources eligible to the California Register were identified within the Project area, ground disturbance always has the potential to encounter unanticipated resources or human burials.

### 3.5.1.2 Paleontological Resources

Potential paleontological resources are normally underground, out of sight, and not easy to locate other than by direct observation after erosion or during excavation. These resources are not found in “soil” but are contained within the geologic deposits or bedrock that underlies the soil layer. Therefore, in order to ascertain whether or not a particular study area has the potential to contain significant fossil resources at the subsurface, it is necessary to review relevant scientific literature and geologic mapping to determine the geology and stratigraphy of the area. Further, to delineate the boundaries of an area of paleontological sensitivity, it is necessary to determine the extent of the entire geologic unit because paleontological sensitivity is not limited to surface exposures of fossil material.

Significant paleontological resources are defined as “identifiable” vertebrate fossils, uncommon invertebrate, plant, and trace fossils that provide taphonomic, taxonomic, phylogenetic, paleoecologic, stratigraphic, or biochronological data. These data are important because they are used to examine evolutionary relationships, provide insight on the development of and interaction between biological communities, establish time scales for geologic studies, and for many other scientific purposes (SVP, 2010).

**Methods**

Paleontological sensitivity was determined using the Potential Fossil Yield Classification (PFYC) developed by the Bureau of Land Management. This system has a multi-level scale based on demonstrated yield of fossils. Occurrences of fossil resources are closely tied to the geologic units (e.g., formations or members) that contain them. The probability for finding significant fossils in a project area can be broadly predicted from previous records of fossils recovered from the geologic units present in or adjacent to the study area. Identification of geologic units and their sensitivity was accomplished through an online paleontological records search of the Los Angeles County Museum of Natural History and the University of California Paleontology Museum, as well as a requested records search from the San Bernardino County Museum, combined with desktop analysis of local geologic maps.

Using the PFYC system, geologic units are classified based on the relative abundance of vertebrate fossils or scientifically significant invertebrate or plant fossils and their sensitivity to adverse impacts. This ranking is not designed to be applied to specific paleontological localities or small areas within units. Although significant localities may occasionally occur in a geologic unit, a few widely scattered important fossils or localities do not necessarily indicate a higher PFYC value; instead, the relative abundance of localities is intended to be the major determinant for the value assignment. Geological setting and known fossil localities were considered in determining paleontological sensitivity according to PFYC criteria. The PFYC system includes the following categories:

- **Class 1 – Very Low**: Geologic units that are not likely to contain recognizable fossil remains.
- **Class 2 – Low**: Sedimentary geologic units that are not likely to contain vertebrate fossils or scientifically significant nonvertebrate fossils.
- **Class 3a – Moderate Potential**: Units are known to contain vertebrate fossils or scientifically significant nonvertebrate fossils, but these occurrences are widely scattered.
Class 3b – Unknown Potential: Units exhibit geologic features and preservational conditions that suggest significant fossils could be present, but little information about the paleontological resources of the unit or the area is known.

Class 4 – High: Geologic units containing a high occurrence of significant fossils.

Class 5 – Very High: Highly fossiliferous geologic units that consistently and predictably produce vertebrate fossils or scientifically significant invertebrate or plant fossils.

Geologic Units Present

The surface of the Project area is mapped almost entirely as Mesozoic plutonic rocks. This includes the Ponderosa West and Ponderosa East borrow areas and the Thousand Pines stockpile area. A small portion of the Project area located directly beneath the dam on the downstream side is mapped as Holocene alluvial sediments.

Mesozoic Plutonic Rocks: Plutonic rocks are molten rocks that cooled slowly deep beneath the surface of the earth (Schoenherr, 1995). Within the Project area, these rocks were formed during the Mesozoic Era (245 to 65 million years old) and consist of various types of granite. Mesozoic plutonic rocks are ranked very low or PFYC 1 (Table 3.5-1) as they do not contain fossils due to the way they form.

Holocene Alluvial Sediments: These young, surface sediments were deposited in valley areas during the Holocene (ca. 12,000 years BP to the present). Holocene sediments consist of alluvial gravel and sand derived from rocks of the San Bernardino Mountains. The Holocene alluvial sediments are ranked low or PFYC 2 (Table 3.5-1). Due to the relatively young age of these sediments, they are not sensitive for fossil resources. Still, there is a possibility of encountering unanticipated Holocene fossils.

Neither the record searches nor background research indicate the presence of any sediments sensitive for paleontological resources in the Project area.

Table 3.5-1. Paleontological Sensitivity Rankings

<table>
<thead>
<tr>
<th>Geologic Units</th>
<th>5 Very High</th>
<th>4 High</th>
<th>3a Moderate; Patchy</th>
<th>3b Moderate; Undemonstrated</th>
<th>2 Low</th>
<th>1 Very Low</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mesozoic plutonic rocks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Holocene alluvial sediments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

Neither the record searches nor background research indicate the presence of any sediments sensitive for paleontological resources in the Project area.

3.5.2 Applicable Regulations, Plans, and Standards

State Regulations

California Environmental Quality Act (Public Resources Code § 21000 et seq) (1970). Historical, archaeological, and paleontological resources are afforded consideration and protection by CEQA (14 CCR Section 21083.2, 14 CCR Section 15064). CEQA Guidelines define significant cultural resources under two regulatory designations: historical resources and unique archaeological resources.

A historical resource is defined as a “resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources”; or “a resource listed in a local register of historical resources or identified as significant in a historical resource survey meeting
the requirements of Section 5024.1(g) of the Public Resources Code”; or “any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California, provided the agency’s determination is supported by substantial evidence in light of the whole record” (14 CCR Section 15064.5[a][3]). While TCPs and cultural landscapes are not directly called out in the state definitions of historical resources, TCPs are places and cultural landscapes are areas, and places and areas are included as types of historical resources. Historical resources that are automatically listed in the California Register include California historical resources listed in or formally determined eligible for the National Register and California Registered Historical Landmarks from No. 770 onward (PRC 5024.1[d]). Locally listed resources are entitled to a presumption of significance unless a preponderance of evidence in the record indicates otherwise.

Under CEQA, a resource is generally considered historically significant if it meets the criteria for listing in the California Register. A resource must meet at least one of the following four criteria (PRC 5024.1; 14 CCR Section 15064.5[a][3]) for eligibility:

1. It is associated with events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States;
2. It is associated with the lives of persons important to local, California, or national history;
3. It embodies the distinctive characteristics of type, period, region, or method of construction, or represents the work of a master or possesses high artistic values;
4. It has yielded or has the potential to yield information important to the prehistory or history of the local area, California, or nation.

Historical resources must also possess integrity of location, design, setting, materials, workmanship, feeling, and association (14 CCR 4852[c]).

An archaeological artifact, object, or site can meet CEQA’s definition of a unique archaeological resource, even if it does not qualify as a historical resource (14 CCR 15064.5[c][3]). An archaeological artifact, object, or site is considered a unique archaeological resource if “it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria (PRC 21083.2[g]):

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person.”

Under California law, cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. All resources nominated for listing in the California Register must have integrity; the authenticity of a historical resource’s physical identity evidenced by the survival of characteristics that existed during the resource’s period of significance. Therefore, resources must retain enough of their historical character or appearance to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and/or association. It must also be judged with reference to the particular criteria under which a resource is proposed for nomination (PRC §5024.1).

**CEQA Guidelines, California Code of Regulations Title 14, Section 15064.5.** When an initial study identifies the existence of, or the probable likelihood of, Native American human remains within the project, a lead
agency shall work with the appropriate Native Americans as identified by the NAHC. The applicant may
develop an agreement for retaining in place or relocating, with appropriate dignity, the human remains
and any items associated with Native American burials with the appropriate Native Americans identified
as the Most Likely Descendant (MLD) by the NAHC.

Public Resources Code (PRC), Section 5097.5 states that no person shall willingly or knowingly excavate,
remove, or otherwise destroy a vertebrate paleontological site or paleontological feature without the
express permission of the overseeing public land agency. It further states under PRC 30244 that any
development that would adversely impact paleontological resources shall require reasonable mitigation.
These regulations apply to projects located on land owned by or under the jurisdiction of the state or a
city, county, district, or other public agency.

PRC, Section 5097.9 et seq. (1982) establishes that both public agencies and private entities using,
occupying, or operating on state property under public permit, shall not interfere with the free expression
or exercise of Native American religion and shall not cause severe or irreparable damage to Native
American sacred sites. This section also creates the NAHC, charged with identifying and cataloging places
of special religious or social significance to Native Americans, identifying and cataloging known graves and
cemeteries on private lands, and performing other duties regarding the preservation and accessibility of
sacred sites and burials.

Local Regulations

County of San Bernardino General Plan, Section V, Conservation Element, Goal CO. 3. This section of the
General Plan discusses the importance of historic and archaeological resources to the County and
establishes that the goal of the County, with respect to cultural resources, is to preserve and promote its
historic and prehistoric cultural heritage. A variety of policies and programs are outlined for the
identification, evaluation, and protection of important archaeological and historic cultural resources in
the County. This section of the General Plan also requires contacting the San Bernardino County
Archaeological Information Center (SBAIC) to identify known cultural resources in an area and/or areas
that have moderate to high sensitivity for cultural resources prior to the County’s application acceptance
for all land use applications. Additionally, this section requires consultation with Native American tribes,
as identified by the NAHC who may have knowledge of important cultural resources, including TCPs, in a
particular area. Specific guidance for the discovery of human remains is provided under Program CO 3.5.5c
of this portion of the General Plan: “If human remains are encountered during grading and other
construction excavation, work in the immediate vicinity will cease and the County Coroner will be
contacted pursuant to the state Health and Safety Code.”

3.5.3 Environmental Impacts and Mitigation Measures

A project that may cause a substantial adverse change in the significance of an historical resource is a
project that may have a significant effect on the environment (PRC 21084.1).

Thresholds of Significance

The following significance criteria are derived from Appendix G of the CEQA Guidelines and Public
Resources Code Section 21083.2. A Project activity would result in a significant impact to cultural or
paleontological resources if it would:

■ CUL-1: Cause a substantial adverse change in the significance of a historical resource as defined in
CEQA Guidelines Section 15064.5 and PRC Section 21083.2.
CUL-2: Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5 and PRC Section 21083.2.

CUL-3: Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

CUL-4: Disturb any human remains, including those interred outside of formal cemeteries (CEQA Guidelines Section 15064.5[d]).

Project Impacts

Impact CUL-1: The Project could cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5. (Less than Significant with Mitigation)

While cultural resources were identified within the Project area, neither the Lake Gregory Dam nor the orchard meet the criteria to be considered as historical resources eligible to the California Register. As no historical resources were identified within the Project area, the Project is not expected to cause a substantial adverse change in the significance of a historical resource. Despite actions taken to ensure that all cultural resources are located prior to construction, there still remains the possibility that previously unidentified, buried historical resources might be encountered during construction. Mitigation Measure CUL-1 requires construction activities to cease near any unanticipated historical resources until evaluated by a cultural resources specialist and for the implementation of any additional necessary resource-specific mitigation. This would ensure that no substantial adverse change would occur to a historical resource or that any substantial adverse change would be treated by resource-specific mitigation. With implementation of MM CUL-1, this impact would be less than significant.

Mitigation Measure

MM CUL-1 Incidental Discovery of Historical Resources or Archaeological Resources. In the event that unanticipated historical resources or archaeological deposits are encountered during ground-disturbing or other construction activities, work must cease within 200 feet of the discovery and a County Cultural Resources Specialist notified. Work may continue only after the deposits are recorded and evaluated by a cultural resources specialist who meets or exceeds the Secretary of the Interior Professional Qualification Standards in archaeology, and any necessary resource-specific mitigation is implemented. Such mitigation could include data recovery excavation, building documentation, etc.

The structure and features associated with the historic orchard within the Thousand Pine stockpile shall be avoided and, if they cannot be, further evaluation efforts shall be undertaken to determine the eligibility of the resource as a whole.

Impact CUL-2: The Project could cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5. (Less than Significant with Mitigation)

As no archaeological resources were identified within the Project area, the Project is not expected to cause a substantial adverse change in the significance of any archaeological resources. Despite actions taken to ensure that all cultural resources are located prior to construction, there still remains the possibility that buried archaeological resources might be encountered during construction. Mitigation Measure CUL-1 requires construction activities to cease within 200 feet of any unanticipated unique archaeological resources until evaluated by a cultural resources specialist and for the implementation of any additional necessary resource-specific mitigation. This would ensure that no substantial adverse
change would occur to a unique archaeological resource or that any substantial adverse change would be treated by resource-specific mitigation. With implementation of MM CUL-1, this impact would be less than significant.

**Mitigation Measure**

**MM CUL-1**  
**Incidental Discovery of Historical Resources or Archaeological Resources.**

*Impact CUL-3: The Project may disturb human remains, including those interred outside of formal cemeteries (Less than Significant with Mitigation)*

No human remains were identified within the Project area, nor is the area considered to be sensitive for human remains. Thus the Project is not expected to disturb human remains, including those interred outside of formal cemeteries. Despite actions taken to ensure that human remains are located prior to construction, there still remains the possibility that undiscovered, buried human remains might be encountered during construction. Mitigation Measure CUL-2 sets forth the process to follow in the case of encountering human remains and would ensure that no human remains would be disturbed or that they were treated appropriately if they must be removed. With implementation of MM CUL-2, this impact would be less than significant.

**Mitigation Measure**

**MM CUL-2:**  
**Incidental Discovery of Human Remains.** In accordance with Section 7050.5 of the California Health and Safety Code and PRC Section 5097.98, if human remains are found, the San Bernardino County Coroner shall be notified within 24 hours of the discovery. No further excavation or disturbance of the site or any nearby area reasonably suspected to overlie potential remains shall occur until the County Coroner has determined, within two working days of notification of the discovery, the appropriate treatment and disposition of the human remains. If the County Coroner determines that the remains do not require an assessment of cause of death and that the remains are or are believed to be Native American, the Coroner shall notify the NAHC within 24 hours. In accordance with Section 5097.98 of the California Public Resources Code, the NAHC must immediately notify those persons it believes to be the MLD of the deceased Native American. The descendants shall complete their inspection within 48 hours of being granted access to the site. The designated Native American representative would then determine, in consultation with the County, the disposition of the human remains.

*Impact PALEO-1: The Project would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature (Less than Significant with Mitigation)*

No unique paleontological resources or geological features were identified within the Project area, nor are the geologic units present in the area considered to be sensitive for such resources. Thus the Project is not expected to directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Although these sediments are not likely to contain fossils, there is a chance that unanticipated resources could be encountered during construction. Mitigation Measure PALEO-1 requires work to cease within 200 feet any unanticipated paleontological resources until evaluated by a qualified paleontologist. By ensuring appropriate treatment by a qualified paleontologist for any paleontological resources encountered, this mitigation measure would prevent destruction of fossils and preserve their inherent scientific value. Thus, with implementation of MM PALEO-1, this impact would be less than significant.
Mitigation Measure

MM PALEO-1:  Incidental Discovery of Paleontological or Geological Resources. If any unanticipated paleontological resources or unique geological resources are encountered during any ground-disturbing or any other construction activities, work should be halted within 200 feet (or as otherwise determined by a qualified paleontologist) of the find until the specimen(s) can recovered, examined, identified, and recorded by a qualified paleontologist; and, if determined necessary, be prepared for permanent curation at an accredited museum repository.

3.5.4 Level of Significance After Mitigation

Based on the analysis above, considering the CEQA Guidelines, Appendix G thresholds of significance, and pursuant to PRC Section 21084.1, this report finds that no known historical, archaeological, or paleontological resources will be affected by the proposed Project. With the implementation of Mitigation Measures CUL-1, CUL-2, and PALEO-1, any impacts to unanticipated cultural or paleontological resources would be less than significant.
3.6 Geology and Soils

This section describes geologic, seismic, and soil conditions in the proposed Project area and analyzes environmental impacts related to geologic and seismic hazards that would result from the Project. The following discussion addresses existing environmental conditions in the affected area, identifies and analyzes environmental impacts, and recommends measures to reduce or avoid adverse impacts anticipated from Project construction and operation. In addition, existing laws and regulations relevant to geologic and seismic hazards are described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Project.

3.6.1 Environmental Setting

Baseline geologic, seismic, and soils information were collected from published and unpublished literature, GIS data, and online sources for the Project and the surrounding area. Data sources included the following: previous reports and studies related to the Lake Gregory Dam provided by the County of San Bernardino; geologic literature, maps, and GIS data from the U.S. Geological Survey and California Geological Survey; soils data from the U.S. Department of Agriculture; and other online reference materials. The study area was defined as the locations of Project components and the areas immediately adjacent to the Project components for most geologic and soils issue areas with the following exception: the study area related to seismically induced ground shaking includes significant regional active and potentially active faults within 50 miles of the Project.

Regional Geologic Setting

The Lake Gregory Dam Rehabilitation Project is located within the western San Bernardino Mountains of the Transverse Ranges geomorphic province of southern California. Geologic structures within the Transverse Ranges have been formed by folding and displacement on normal, thrust, and reverse faults accommodating the regional compressional strain from the convergence of the North American and Pacific plates along a northwest-trending segment of San Andreas Fault. This has resulted in uplift, mountain formation, basin formation, and seismicity throughout the region. The Transverse Ranges geomorphic province is characterized by a complex series of mountain ranges and valleys with dominant east-west trends.

The Project area is located on the Big Bear Plateau, an upland plateau within the western San Bernardino Mountains that ranges in elevation from approximately 6,500 to 7,500 feet. The San Bernardino Mountains are primarily comprised of Mesozoic granitic rocks with minor Paleozoic metamorphic and marine sedimentary rocks and Quaternary alluvial and fluvial deposits.

Local Geology

The proposed Project area is underlain by Mesozoic granitic bedrock consisting of quartz monzanne and granodiorite (Morton & Miller, 2006). These units are typically deeply weathered and locally highly fractured and jointed. Erosion in valleys has removed much of the weathered horizon leaving hard, moderately jointed granitic rocks exposed. Thin colluvium is likely present on the nearby hill slopes and thin alluvial and stream deposits are likely present in the nearby valleys and drainages. Figure 3.6-1 presents the local geology in the vicinity of the proposed Project.
3. ENVIRONMENTAL SETTING, ANALYSIS, AND MITIGATION MEASURES

Figure 3.6-1
Geologic Map

Geologic Units
- Qdg - Disturbed ground
- Qw - Very young wash deposits
- Qf - Very young alluvial fan deposits
- Qls - Very young landslide deposits
- Qyls - Young landslide deposits
- Qols - Old landslide deposits
- Qvof - Very old alluvial fan deposits
- Qvols - Very old landslide deposits
- Tcc - Conglomerate of Crestline
- Tcr - Crowder Formation
- Kkc - Monzogranite of Kinley Creek
- Kcc - Monzogranite of City Creek
- Ja - Granodiorite of Arrowhead Peak
- Mzsl - Mixed granitic rocks of Silverwood Lake
- MzPrd - Geneiss of Devil Canyon

Geologic Contacts
- Contact, accurately located
- High-angle fault, accurately located
- High angle fault, approximately located
- High-angle fault, concealed beneath mapped unit

Geology Source: Geologic Map of the San Bernardino and Santa Ana 30' X 60' Quadrangles, California, USGS OFR 2006-1217.
Previous Studies

Several previous reports for the Lake Gregory Dam site were reviewed for this analysis. A brief summary of the reports reviewed are listed below. These reports are located in Appendix 5.

- **Phase I Investigation – Lake Gregory Regional Park Dam Study, San Bernardino County, California**, by Woodward-Clyde Consultants, dated June 1991 (Appendix 5a). The purpose of this study was to review information regarding the seismic stability of the dam and evaluate the potential for fault rupture hazard at the dam. The report included a review of a previous study conducted at the site by Pioneer Consultants in 1986 which concluded that the dam had an inadequate factor of safety under seismic loading conditions and that the dam embankment fill and underlying foundation soils had a potential for liquefaction. Woodward-Clyde concluded that the identified fault splays were likely minor splays related to the nearby Tunnel Ridge Fault, and due to their short length are unlikely to generate seismic events, but may display offset related to seismic events on the Tunnel Ridge Fault. Woodward-Clyde recommended further investigation into the age of activity of the Tunnel Ridge and ‘Unnamed’ faults and further evaluation of the dam’s seismic stability through geotechnical exploration and analyses.

- **Interim Report, Phase II/Task 1 Geological Investigation, Lake Gregory Dam, San Bernardino County, California**, by Woodward-Clyde Consultants, dated May 1994 (Appendix 5b). This report presents the results of geologic mapping conducted to further evaluate the potential for surface fault displacement beneath Lake Gregory Dam. Based on existing geologic mapping and aerial photo review, Woodward-Clyde identified two air photo lineaments in the vicinity of the dam, with one trending toward the dam. Woodward-Clyde concluded no significant faulting has occurred in the immediate vicinity of the Lake Gregory Dam, based on apparent lack of strike-slip or dip-slip movement along the lineament trending toward the dam that. However, small displacements may still occur at the dam and Woodward-Clyde recommended that further investigation should be conducted to rule out the possible presence of the Tunnel Ridge Fault crossing the Lake Gregory Dam site.

- **Fault Hazard Evaluation Report, Lake Gregory Dam, San Bernardino County, California**, by D. Scott Magorien, CEG dated April 2004 (Appendix 5c). Magorien conducted a fault hazard evaluation of the Lake Gregory Dam to assess the location and age of the Tunnel Ridge Fault and other mapped faults in the vicinity of the dam. Magorien reviewed and conducted mapping of the road cuts and outcrops in the vicinity of the dam and a portion of the outlet tunnel and reviewed of the geologic maps prepared during dam construction. He concluded that there are no through-going faults beneath the dam, but instead there is a complex set of shears and fractures within the bedrock. Based on analyses and mapping for this study, Magorien concluded that there is no evidence of Holocene faults crossing the Lake Gregory Dam and that the closest Holocene fault to the site is the Lake Gregory Fault, referred to as the ‘Unnamed fault’ by Woodward-Clyde, which is located approximately 1,300 feet north of the dam transecting the lake in an east-west orientation. Magorien also presented new data based on trenching in the Crestline area that indicated the Lake Gregory Fault was active and capable of producing a maximum earthquake of M6.25. Magorien concluded that movement on the Lake Gregory Fault could result in “sympathetic movement” on the bedrock shears and joints below the dam but that movement would be on the order of a few inches if there was any movement at all.

- **Stability Investigation, Lake Gregory Dam, Dam ID 1803-003, County of San Bernardino, California**, by Tetra Tech dated February 2012 (Appendix 5d). Tetra Tech conducted an evaluation of the stability of the Lake Gregory Dam to address issues raised by the Division of Safety of Dams (DSOD) about potential

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1 Air photo lineament - a linear feature observed on aerial photographs which is an expression of an underlying geological structure such as faults or bedrock joints.
inadequacies of the dam during a seismic event. Four exploratory borings were conducted as part of this study to depths ranging from 41 to 95 feet below the crest of the dam. Materials encountered consisted of embankment fill of loose to medium dense, non-plastic silty sands and silty sands with gravel and local cobbles, residual granitic soil (encountered in two borings) of loose to medium dense, fine to coarse grained silty sand and silty sand with gravel, and moderately to completely weathered, highly friable, and highly fractured granitic rock. Piezometers installed as part of the study indicate that groundwater occurs at depths of 25 to 37 feet below the dam crest. Tetra Tech’s analyses concluded that the dam is stable in static conditions, but that the dam is not adequate in terms of modern good engineering practice or to DSOD requirements under earthquake and post-earthquake conditions. Where saturated by seepage through the dam, the low density embankment and residual soil materials are potentially liquefiable. Tetra Tech identified a zone of liquefiable fill in the embankment between 25 and 30 feet below the dam crest that is approximately 20 to 40 feet thick. Tetra Tech’s slope stability and deformation analyses indicate a possible maximum vertical deformation of approximately 18 feet for the dam in the event of a large earthquake near the dam.

**Topography and Slope Stability**

Important factors that affect the slope stability of an area include the steepness of the slope, the relative strength of the underlying rock material, and the thickness and cohesion of the overlying colluvium. The steeper the slope or the less strong the rock, the more likely the area is susceptible to landslides. The steeper the slope and the thicker the colluvium, the more likely the area is susceptible to debris flows. Another indication of unstable slopes is the presence of old or recent landslides or debris flows. Both older Pleistocene and young Holocene landslides are mapped in the general Project area, north of the site near the Cleghorn Fault zone and west of the site in the Valley of Enchantment (see Figure 3.6-1). No known landslides are mapped in the immediate vicinity of the Lake Gregory Dam or the Ponderosa Borrow Sites. The San Bernardino County Geologic Hazard Overlay maps the Project area as having low to moderate landslide susceptibility (County of San Bernardino, 2010).

Although Lake Gregory is located on the Big Bear Plateau, the topography of the Project area consists of gentle to moderately steep slopes adjacent and near to the Houston Creek drainage. Elevations in the Project area range from approximately 4,450 to 4,850 feet. The Lake Gregory Dam has an elevation of 4,530 at its crest with an approximate embankment height of 90 feet. Both of the Ponderosa Borrow Sites are located on north-facing slopes of a gently sloping hillside/drainage with elevations ranging from about 4,815 to 4,850 feet for the Ponderosa West Borrow Site and ranging from 4,750 to 4,790 feet for the Ponderosa East Borrow Site.

**Soils**

The soils underlying the Project area reflect the underlying geologic units, the extent of weathering of the underlying geologic units, the degree of slope, and the degree of modification by man. Soil mapping by the USDA National Resource Conservation Service (NRCS) for the San Bernardino National Forest Area Soil Survey, accessed through the NRCS Web Soil Survey website, provides information for surface and near-surface subsurface soil materials (NRCS, 2014). Two soil units are mapped as underlying soil disturbance areas of the Project, which include dam, the borrow sites, and the unpaved access road though Camp Switzerland. The two soil units are both from the Morical-Wind River families complex.

Although the dam area itself is mapped as Morical-Wind Rivers families complex, the soil materials making up the dam consist of engineered fill and are not included in the following soil discussions. Materials encountered within the embankment fill are described above under Previous Studies. The soils adjacent to the dam and underlying most of the Ponderosa East Borrow Site are mapped as Morical-Wind Rivers
families complex, 15-30 percent slopes. The Ponderosa West Borrow Site and the westernmost end of the Ponderosa East Borrow Site are underlain by the Morical-Wind Rivers families complex, 30 to 50 percent slopes. The Morical-Wind River families complex soils are formed on moderate to steeply dipping mountain slopes and consist of well-drained, relatively thin soils formed from granitic colluvium and in-place weathered granitic bedrock with very little organic content in the surface horizon.

The general description and select physical characteristics of erosion hazards and shrink/swell potential for these soil units were reviewed to evaluate potential hazards to the proposed Project related to soil conditions. Table 3.6-1 presents these select characteristics and the general susceptibility of the units underlying the Project to sheet and rill erosion, wind erodibility, and shrink-swell potential. The soil units in the Project area are complexes made up of several soil types/families, therefore the table presents a general potential for these characteristics to occur in the soil unit based on the major components of the soils.

Table 3.6-1. Key Characteristics of Soils Units Underlying the Project Area

<table>
<thead>
<tr>
<th>Soil Association</th>
<th>Soil Type/Texture</th>
<th>Typical Depth to Bedrock (inches)</th>
<th>Susceptibility to Sheet and Rill Erosion ¹</th>
<th>Wind Erodibility ²</th>
<th>Shrink-Swell Potential ³</th>
</tr>
</thead>
<tbody>
<tr>
<td>Morical-Wind Rivers families complex, 15 to 30 percent slopes</td>
<td>Clay loam, loam, sandy loam, coarse sandy loam, gravelly sandy loam, and weathered bedrock</td>
<td>49 to 54</td>
<td>Low to Moderate</td>
<td>Low to Moderate</td>
<td>Low to Moderate</td>
</tr>
<tr>
<td>Morical-Wind Rivers families complex, 30 to 50 percent slopes</td>
<td>Clay loam, loam, sandy loam, coarse sandy loam, gravelly sandy loam, and weathered bedrock</td>
<td>49 to 54</td>
<td>Low to Moderate</td>
<td>Low to Moderate</td>
<td>Low to Moderate</td>
</tr>
</tbody>
</table>

Notes:
1 – Based on Erosion factor K (used by the NRCS in the Universal Soil Lose Equation), which indicates the susceptibility of a soil to sheet and rill erosion. Values of K range from 0.02 to 0.69 with higher values being more susceptible to sheet and rill erosion.
2 – Soils are assigned to wind erodibility groups based on their susceptibility to wind erosion, soils assigned to group 1 are the most susceptible and soils assigned to group 8 are the least susceptible.
3 – Linear extensibility is the method used by the NRCS to determine the shrink-swell potential of soils. Linear extensibility refers to the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state. The volume change is reported as percent change for the whole soil. The amount and type of clay minerals in the soil influence volume change. The shrink-swell potential is low if the soil has a linear extensibility of less than 3 percent; moderate if 3 to 6 percent; high if 6 to 9 percent; and very high if more than 9 percent. If the linear extensibility is more than 3 percent, shrinking and swelling can cause damage to buildings, roads, and other structures and to plant roots. Special design commonly is needed in areas with expansive soils.

Potential soil erosion hazards vary depending on the use, conditions, and textures of the soils. The properties of soil which influence erosion by rainfall and runoff affect the infiltration capacity of a soil, as well as the resistance of a soil to detachment and being carried away by falling or flowing water. Soils on steeper slopes would be more susceptible to erosion due to the effects of increased surface flow (runoff) on slopes where there is little time for water to infiltrate before runoff occurs. Soils containing high percentages of fine sands and silt and that are low in density, are generally the most erodible. As the clay and organic matter content of soils increases, the potential for erosion decreases. Clays act as a binder to soil particles, thus reducing the potential for erosion.

Expansive soils are characterized by their ability to undergo significant volume change (shrink and swell) due to variation in soil moisture content. Changes in soil moisture could result from a number of factors, including rainfall, landscape irrigation, utility leakage, and perched groundwater. Expansive soils are typically very fine grained with a high to very high percentage of clay. Soils with moderate to high shrink-swell potential would be classified as expansive soils.
Faults and Seismicity

The seismicity of southern California is dominated by the intersection of the north-northwest trending San Andreas Fault system and the east-west trending Transverse Ranges Fault system. Both systems are responding to strain produced by the relative motions of the Pacific and North American Tectonic Plates. This strain is relieved by right-lateral strike-slip faulting on the San Andreas and related faults, left-lateral strike slip on the Garlock Fault, and by vertical, reverse-slip or left-lateral strike-slip displacement on faults in the Transverse Ranges. The effects of this deformation include mountain building, basin development, deformation of Quaternary marine terraces, widespread regional uplift, and generation of earthquakes. The Transverse Ranges, which includes the San Bernardino Mountains, are characterized by numerous geologically young faults. These faults can be classified as historically active, active, potentially active, or inactive, based on the following criteria (CGS, 1999):

1. Faults that have generated earthquakes accompanied by surface rupture during historic time (approximately the last 200 years) and faults that exhibit aseismic fault creep are defined as Historically Active.
2. Faults that show geologic evidence of movement within Holocene time (approximately the last 11,000 years) are defined as Active.
3. Faults that show geologic evidence of movement during the Quaternary time (approximately the last 1.6 million years) are defined as Potentially Active.
4. Faults that show direct geologic evidence of inactivity during all of Quaternary time or longer are classified as Inactive.

Although it is difficult to quantify the probability that an earthquake will occur on a specific fault, this classification is based on the assumption that if a fault has moved during the Holocene Epoch, it is likely to produce earthquakes in the future. Blind thrust faults do not intersect the ground surface, and thus they are not classified as active or potentially active in the same manner as faults that are present at the earth’s surface. Blind thrust faults are seismogenic structures with no surface expression and thus the activity classification of these faults is predominantly based on geologic data from deep oil wells, geophysical profiles, historic earthquakes, and microseismic activity along the fault.

Since periodic earthquakes accompanied by surface displacement can be expected to continue in the study area through the lifetime of the proposed Project, the effects of strong groundshaking and fault rupture are of primary concern to safe operation of the Lake Gregory Dam Rehabilitation Project.

The Project area will be subject to ground shaking associated with earthquakes on faults of the San Andreas and Transverse Ranges fault systems. Active faults of the San Andreas system are predominantly strike-slip faults accommodating translational movement. Active reverse or thrust faults in the Transverse Ranges include blind thrust faults responsible for the 1987 Whittier Narrows Earthquake and 1994 Northridge Earthquake, and the range-front faults responsible for uplift of the San Gabriel and San Bernardino Mountains. The Transverse Ranges fault system consists primarily of blind, reverse, and thrust faults accommodating tectonic compressional stresses in the region. This combination of translational and compressional stresses gives rise to diffuse seismicity across the region.

Figure 3.6-2 (Regional Active Faults and Historic Earthquakes) shows locations of active and potentially active regional faults (representing possible seismic sources) and earthquakes in the region surrounding the Project area. Regional active and potentially active faults within 50 miles of the Project that are significant potential seismic sources are presented in Table 3.6-2.
Table 3.6-2. Significant Active and Potentially Active Faults within 50 miles of the Proposed Project

<table>
<thead>
<tr>
<th>Fault Name</th>
<th>Distance 1 (miles)</th>
<th>Estimated Maximum Magnitude 2,3</th>
<th>Fault Type and Dip Direction 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cleghorn</td>
<td>1.9</td>
<td>6.8</td>
<td>Left Lateral Strike Slip, 90°</td>
</tr>
<tr>
<td>San Andreas</td>
<td>4.6</td>
<td>6.9 – 8.0</td>
<td>Right Lateral Strike Slip, 90°</td>
</tr>
<tr>
<td>North Frontal Thrust</td>
<td>5.9</td>
<td>7.0 – 7.2</td>
<td>Reverse, 49°S</td>
</tr>
<tr>
<td>San Jacinto</td>
<td>7.6</td>
<td>7.1 – 7.9</td>
<td>Right Lateral Strike Slip, 90°</td>
</tr>
<tr>
<td>Sierra Madre</td>
<td>11.0</td>
<td>6.7 – 7.2</td>
<td>Reverse, 45-53°N</td>
</tr>
<tr>
<td>Helendale-South Lockhart</td>
<td>22.5</td>
<td>7.4</td>
<td>Right Lateral Strike Slip, 90°</td>
</tr>
<tr>
<td>Whittier</td>
<td>31.3</td>
<td>7.0</td>
<td>Right Lateral Strike Slip, 90°</td>
</tr>
<tr>
<td>Elsinore</td>
<td>33.7</td>
<td>6.9 – 7.8</td>
<td>Right Lateral Strike Slip, 90°</td>
</tr>
<tr>
<td>Lenwood-Lockhart-Old Woman</td>
<td>35.4</td>
<td>7.5</td>
<td>Right Lateral Strike Slip, 90°</td>
</tr>
<tr>
<td>Springs</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Johnson Valley</td>
<td>39.8</td>
<td>6.9</td>
<td>Right Lateral Strike Slip, 90°</td>
</tr>
<tr>
<td>Puente Hill Blind Thrust</td>
<td>40.8</td>
<td>7.1</td>
<td>Blind Thrust, 25°N</td>
</tr>
</tbody>
</table>

Notes:
1 – Fault distances measured from USGS GIS Quaternary fault data (USGS, 2010).
2 – Maximum Earthquake Magnitude – the maximum earthquake that appears capable of occurring under the presently known tectonic framework, magnitude listed is “Ellsworth-B” magnitude from USGS OF08-1128 (Documentation for the 2008 Update of the United States National Seismic Hazard Maps) unless otherwise noted.
3 – Range of Magnitudes represents varying potential rupture scenarios with single or multiple segments of the fault rupturing in various combinations.
4 – Fault parameters from USGS OF08-1128 (Documentation for the 2008 Update of the United States National Seismic Hazard Maps) unless otherwise noted.

Active faults near the Project site include the Lake Gregory Fault, the Cleghorn Fault zone, and the San Andreas Fault zone. The closest active fault is the Lake Gregory Fault, located approximately 1,300 feet south of the dam. This fault is identified on geologic maps of the area as “Unnamed Fault” and was renamed by consultants working in the area. It is an approximately six-mile-long east-west trending high-angle fault that passes through Lake Gregory (Magorien, 2004). Recent mapping and fault trenching studies along this fault indicate that it has offset Holocene alluvium and has a small amount of vertical movement as well as primary left lateral strike slip movement (Magorien, 2004). Maximum estimated magnitude for this fault, based on length and slip type and direction, has been calculated at M 6.25 (Magorien, 2004).

The Cleghorn Fault zone is approximately 15.5 miles long and is divided into two sections, Northern and Southern. The Northern section consists of the West and East Silverwood Lake faults and the Grass Valley Fault and the Southern section consists of the Cleghorn Fault. The closest segment of the Cleghorn Fault zone is the Southern section that is located approximately 1.9 miles north of the Project site. Activity on this fault is uncertain as differing investigators have concluded a Holocene age and a Pleistocene only date (USGS, 2014a). To be conservative, the analysis for this Project will consider this fault to be conditionally active, otherwise it is considered a potentially active fault.

The San Andreas Fault zone is the closest significant active fault to the Project, located approximately 4.6 miles southwest of the Project. The San Andreas Fault zone is approximately 682 miles long and is the main structure of the San Andreas Fault system, a network of faults with predominantly right lateral strike-slip displacement that accommodates the majority of the north-south motion between the North American and Pacific plates. The San Andreas Fault zone consists of 10 sections, with the closest section to the Project being the San Bernardino Mountains section. The San Bernardino Mountains section of the San Andreas Fault zone is characterized by a large left-restraining step that gives rise to a complex zone of right lateral strike-slip, oblique, and thrust faults. The northern part of the San Bernardino Mountains section was last ruptured by the unnamed 1812 earthquake which occurred along the Mojave section of the San Andreas Fault zone (USGS, 2014b).
Regional Historic Earthquakes >M4.5 between 1769 and 2014

<table>
<thead>
<tr>
<th>Magnitude</th>
<th>Faults</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.50 - 4.99</td>
<td>Active Faults</td>
</tr>
<tr>
<td>5.00 - 5.99</td>
<td>Potentially Active Faults</td>
</tr>
<tr>
<td>6.00 - 6.99</td>
<td>Blind Thrust Faults - (faults do not intersect the surface, mapped trace represents projection of upper edge of the fault to surface; rectangle represents projection of the fault plane to the surface)</td>
</tr>
<tr>
<td>7.00 - 7.99</td>
<td></td>
</tr>
</tbody>
</table>

Fault data sources: USGS and CGS, 2010

Figure 3.6-2

Regional Active Faults and Historic Earthquakes

Project Site

Fault data sources: USGS and CGS, 2010
Fault Rupture

Fault rupture is the surface displacement that occurs when movement on a fault deep within the earth breaks through to the surface. Fault rupture and displacement almost always follows preexisting faults, which are zones of weakness, however not all earthquakes result in surface rupture (i.e., earthquakes that occur on blind thrusts do not result in surface fault rupture). Rupture may occur suddenly during an earthquake or slowly in the form of fault creep. In addition to damage caused by ground shaking from an earthquake, fault rupture is damaging to buildings and other structures due to the differential displacement and deformation of the ground surface that occurs from the fault offset leading to damage or collapse of structures across this zone.

No known significant active fault crosses the borrow sites or the Lake Gregory Dam site; however, several investigations have been conducted to characterize potential faults that were mapped in the bedrock near to and beneath the dam during its construction. These investigations are summarized above under Previous Studies. Based on mapping and analyses of road cuts and outcrops in the vicinity of the dam and a portion of the outlet tunnel by Magorien (2004), the features mapped under the dam during Project construction are likely not through-going faults, but instead there is a complex set of shears and fractures within the bedrock.

The Tunnel Ridge Fault is an approximately 17.5 miles long, near vertical Late Quaternary aged fault that trends toward Lake Gregory. This fault is broken into several segments with differing apparent motion, left lateral oblique slip on the north, and vertical dip-slip on the central and southern segments. No Holocene offset has been mapped on this fault and there are no significant offsets of drainages across it or of basement rock types or erosional surfaces. This fault is not considered a seismic source or a potential for offset of the Lake Gregory Dam (Magorien, 2004).

Ground Shaking

An earthquake is classified by the amount of energy released, which traditionally has been quantified using the Richter scale. Recently, seismologists have begun using a Moment Magnitude (M) scale because it provides a more accurate measurement of the size of major and great earthquakes. For earthquakes of less than M 7.0, the Moment and Richter Magnitude scales are nearly identical. For earthquake magnitudes greater than M 7.0, readings on the Moment Magnitude scale are slightly greater than a corresponding Richter Magnitude. Review of earthquake data for the Project area indicates that approximately 23 earthquakes of greater than M 5.5 have occurred within 50 miles of the proposed Project, including the M 7.3 Landers Earthquake and several of its aftershocks, including the M 6.5 Big Bear Earthquake (SCEDC, 2014). These earthquakes are shown on Figure 3.6-2.

The intensity of the seismic shaking, or strong ground motion, during an earthquake is dependent on the distance between the Project area and the epicenter of the earthquake, the magnitude of the earthquake, and the geologic conditions underlying and surrounding the Project area. Earthquakes occurring on faults closest to the Project area would most likely generate the largest ground motion. The intensity of earthquake-induced ground motions can be described using peak site accelerations, represented as a fraction of the acceleration of gravity (g). The USGS National Seismic Hazards (NSH) Maps were used to estimate approximate peak ground accelerations (PGAs) in the proposed Project area (USGS, 2014c). The NSH Maps depict peak ground accelerations with a 2 percent probability of exceedance in 50 years, which corresponds to a return interval of 2,475 years and a 10 percent probability of exceedance in 50 years, which corresponds to a return interval of 475 years for a maximum considered earthquake. The estimated approximate peak ground accelerations from large earthquakes for the Project area are approximately 0.63 g and 1.06 g, respectively, which correspond to strong ground shaking.
Liquefaction

Liquefaction is the phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments and the magnitude and frequency of earthquakes in the surrounding region. Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects (Youd and Perkins, 1978). In addition, densification of the soil resulting in vertical settlement of the ground can also occur.

In order to determine liquefaction susceptibility of a region, three major factors must be analyzed. These include: (a) the density and textural characteristics of the alluvial sediments; (b) the intensity and duration of groundshaking; and (c) the depth to groundwater.

The majority of the Project area, with the exception of the dam embankment fill, is nonliquefiable granitic bedrock. The dam embankment fill consists primarily of loose to medium dense, non-plastic silty sands and silty sands with gravel and was derived from borrow excavation of the overburden and highly weathered bedrock from the reservoir footprint and embankment foundation (Tetra Tech, 2012; see Appendix 5d). Local gravel and cobbles were also encountered in the fill. Where present, the residual soils beneath the fill, resulting from decomposition of the granitic rocks, were loose to medium dense, fine to coarse grained silty sand and silty sand with gravel.

Groundwater occurs as seepage through the dam embankment. Three piezometers installed in geotechnical borings drilled in 2011 along the dam crest reveal groundwater occurs at depths of 25 to 37 feet below the dam crest. The piezometric surface through the dam embankment slopes steeply from elevation 4,505 feet on the upstream face to about elevation 4,445 feet at the downstream face (Tetra Tech, 2012; see Appendix 5d).

Where saturated by seepage through the dam, the low-density embankment and residual soil materials are potentially liquefiable. Tetra Tech (2012; see Appendix 5d) identified a zone of liquefiable fill in the embankment between 25 and 30 feet below the dam crest that is approximately 20 to 40 feet thick. Tetra Tech’s slope stability and deformation analyses for the dam indicates a possible maximum vertical deformation of approximately 18 feet for the dam in the event of seismic shaking and liquefaction of the embankment fill.

3.6.2 Applicable Regulations, Plans, and Standards

Federal

The Clean Water Act (CWA) establishes the basic structure for regulating discharges of pollutants into the Waters of the U.S. The CWA authorized the Public Health Service to prepare comprehensive programs for eliminating or reducing the pollution of interstate waters and tributaries and improving the sanitary condition of surface and underground waters with the goal of improvements to and conservation of waters for public water supplies, propagation of fish and aquatic life, recreational purposes, and agricultural and industrial uses. The Project construction would disturb a surface area greater than one acre; therefore, in compliance with the CWA, the Project would be required to obtain a National Pollution Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activity. Compliance with the NPDES would require that the County submit a Storm Water Pollution Prevention Plan (SWPPP).
3. ENVIRONMENTAL SETTING, ANALYSIS, AND MITIGATION MEASURES

State

Division of Safety of Dams. The Department of Water Resources, with regulatory power from the California Water Code, delegates dam safety to the Division of Safety of Dams (DSOD) to protect people against loss of life and property from dam failure. California Water Code, Division 3 and CA Code of Regulations, Title 23 Waters presents the statutes and regulations DSOD follows regarding dams under its jurisdiction. DSOD engineers and engineering geologists review and accept plans and specifications for the design of dams and oversee their construction to ensure compliance with the accepted plans and specifications. Geologic and seismic reviews include site geology, seismic setting, geologic/geotechnical site investigations, construction material evaluation, and seismic dam stability. In addition, DSOD engineers conduct annual inspections on existing dams to ensure the dams are performing and being maintained in a safe manner.

Alquist-Priolo Earthquake Fault Zoning Act of 1972, Public Resources Code (PRC), sections 2621–2630 (formerly the Special Studies Zoning Act). Regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. While this act does not specifically regulate dams; it does help define areas where fault rupture is most likely to occur. This Act groups faults into categories of active, potentially active, and inactive. Historic and Holocene age faults are considered active, Late Quaternary and Quaternary age faults are considered potentially active, and pre-Quaternary age faults are considered inactive. These classifications are qualified by the conditions that a fault must be shown to be “sufficiently active” and “well defined” by detailed site-specific geologic explorations in order to determine whether building setbacks should be established.

Seismic Hazards Mapping Act (the Act) of 1990 (Public Resources Code, Chapter 7.8, Division 2, sections 2690–2699). Directs the California Department of Conservation, Division of Mines and Geology [now called California Geological Survey (CGS)] to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards. Cities, counties, and state agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes. The Act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones.

Local

San Bernardino County. The San Bernardino County Development Code and the San Bernardino General Plan include policies and regulations for the avoidance of geologic hazards and the protection of unique geologic features. The Safety Element section of the San Bernardino County General Plan (County of San Bernardino, 2007) provides for mitigation of geologic hazards through a combination of engineering, construction, land use, and development standards. The Plan addresses the geologic hazards present within the County, including fault rupture, ground shaking, liquefaction, seismically-generated subsidence, seiche and dam inundation, landslides/mudslides, non-seismic subsidence, erosion and volcanic activity. The County has prepared Hazard Overlay Maps to address fault rupture, liquefaction hazards, and landslide hazards. Special consideration, including possible engineering/geologic evaluation, is required for development of sites designated on the maps.

Under the Surface Mining and Reclamation Act of 1975 (SMARA) the County of San Bernardino is the lead agency for all unincorporated areas of the County for issuing Mining Conditional Use Permits (CUP) and in approving Reclamation Plans. The Development Code includes regulations regarding these permits and plans. The Land Use Services Department is responsible for issuing and enforcing the Mining CUP and Reclamation Plans.
Additionally, the County Building and Safety Department enforces Building Standards adopted by the State of California and the County of San Bernardino including the California Building Code contained in Title 24 of the California Code of Regulations.

### 3.6.3 Environmental Impacts and Mitigation Measures

#### Thresholds of Significance

The impact analysis describes conclusions regarding the nature and significance of each identified impact that would result from the proposed Project. The following significance criteria for geology and soils have been identified and utilized to make these significance conclusions based on the CEQA Appendix G Environmental Checklist and adjusted for relevance to this analysis based on local conditions and the Project description. For purposes of the CEQA analysis for this Project, an impact would be considered significant and require mitigation if the Project would:

- **GS-1**: Expose people or structures to potential risk of loss or injury where there is high potential for earthquake-related ground rupture in the vicinity of major fault crossings.
- **GS-2**: Expose people or structures to potential risk of loss or injury where there is high potential for seismically induced ground shaking which results in landslides, liquefaction, settlement, lateral spreading, and/or surface cracking.
- **GS-3**: Results in triggering or acceleration of geologic processes, such as landslides, substantial soil erosion, or loss of topsoil during construction.
- **GS-4**: Expose people or structures to potential risk of loss or injury where expansive soils or other unstable soils are present.

The following threshold from the CEQA Appendix G Environmental Checklist is not relevant to the proposed Project and is not discussed further beyond the summary below:

- **VI (e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.**

  As the Project would not include the construction of any restroom facilities or other components requiring wastewater disposal, there would be no impact related to CEQA Threshold VI (e).

**Impact Assessment Methodology**

The geology and soils impacts of the proposed Project are discussed below under impact headings corresponding to each of the significance criteria presented in the preceding section. The analysis describes the impacts of the Project related to geologic and seismic hazards for each criterion, and determines whether implementation of the proposed Project would result in significant impacts by evaluating effects of construction and operation of the proposed Project against the affected environment described above in Section 3.6.1.

Impacts are described in terms of location, context, and intensity, and identified as being either short- or long-term, or direct and indirect in nature. Beneficial as well as adverse impacts are identified, with a discussion of the effect and risk to public health and safety. Mitigation measures, where necessary, are proposed to avoid, minimize, or rectify impacts.
Project Impacts

Impact GS-1: Project structures could be damaged by surface fault rupture at crossings of active faults exposing people or structures to hazards (Less than Significant)

Several small fault splays were identified in the bedrock beneath the dam during construction of the dam, which were identified as potentially being small splays of the nearby Tunnel Ridge Fault (Woodward-Clyde, 1991 and 1994). The Tunnel Ridge Fault has not been identified as having any Holocene offset and the small fault splays identified under the dam have been identified as likely being a complex zone of shears and fractures within the bedrock (Magorien, 2004). The closest identified active fault is the Lake Gregory Fault which is located approximately 1,300 feet north of the dam, transecting the lake in an east-west orientation (Magorien, 2004). A seismic event on the Lake Gregory Fault could potentially result in “sympathetic movement” on the order of a couple of inches on the shears identified beneath the dam; however, this small amount of offset would not impact the integrity of the dam (Magorien, 2004). No faults have been identified in the immediate vicinity of the Ponderosa Borrow Sites. Therefore, impacts to Project components and structures from surface fault rupture would be less than significant and no mitigation is necessary.

Impact GS-2: Project structures could be damaged by seismically induced ground shaking, landslides, liquefaction, settlement, lateral spreading, and/or surface cracking, exposing people or structures to hazards (Beneficial Impact)

There are no known mapped landslides adjacent to or near the Lake Gregory Dam site or the Ponderosa Borrow Sites. Although there are moderately steep hill slopes in the general Project area, none of these slopes are immediately adjacent or upslope of the dam or borrow sites and it is unlikely that a seismically induced landslide on one of these slopes would cause damage to the dam. If the maximum amount of material is removed from each borrow site, excavations may be approximately 10 to 15 feet deep. Seismic shaking could cause slope failures at and near the edges of the borrow sites; however, the Project would be required to obtain a County Mining Conditional Use Permit and prepare a Mining and Land Reclamation Plan which would include site surveys, safety measures, and surface reclamation plans that would reduce the potential impact from slope failures to less than significant with no mitigation necessary. The borrow sites consist of shallow soil over granitic bedrock and would not be subject to liquefaction-related phenomena. The stability evaluation conducted by Tetra Tech (2012; see Appendix 5d) for the Lake Gregory Dam found that the dam is not stable with respect to modern good engineering practice or to DSOD requirements under earthquake and post-earthquake conditions, and would likely exhibit significant seismically induced deformation due to strong groundshaking and/or liquefaction of the embankment fill. A zone of 20- to 40-foot-thick liquefiable embankment fill was identified between 25 and 30 feet below the dam crest, and slope stability and deformation analyses indicate a possible maximum vertical deformation of approximately 18 feet for the dam in the event of a large regional earthquake.

While Project construction, by disturbing the existing dam face, could temporarily increase the potential for slope failure and deformation of the dam, it is unlikely that a significant seismic event would occur during this small window of time. Additionally, design and construction operations will be under the supervision of the DSOD as required by Division 3 of the California Water Code, which would minimize the potential for construction-induced slope failures on the dam. The Project is designed to improve the long-term stability of the dam and ultimately will reduce the potential for dam deformation and failure due to seismically induced groundshaking and liquefaction. As a result of the reduced risk, the Project effect related to Impact GS-2 is considered beneficial. No mitigation is necessary.
Impact GS-3: Erosion could be triggered or accelerated due to construction activities (Less than Significant)

Construction activities for the Project would cause ground disturbance and loosen soil which could trigger or accelerate erosion. These activities include removal of trees and shrubs, excavation of two borrow sites, removal and stockpiling of material from the downstream face of the dam, creation of access roads, temporary realignment of Lake Drive, relocation of utilities, and construction of the downstream stabilizing buttress. Material for construction will be imported from existing nearby stockpiles and the proposed two Ponderosa Borrow Sites, and processed at the construction site, staging area, and/or stockpile and borrow site locations. Current regulations would require that the Project obtain a NPDES General Permit for Storm Water Discharges Associated with Construction Activity as construction would disturb a surface area greater than one acre. Additionally, compliance with the NPDES would require that the County submit a SWPPP. The SWPPP would require development and implementation of BMPs to identify and control erosion, which would reduce the potential for construction trigger erosion. Additionally, the Project would be required to prepare a Mining CUP and Reclamation Plan for the borrow sites which would require grading and revegetation on the sites after closure of the sites to minimize erosion and to convey surface runoff to natural drainage courses. Compliance with applicable regulations would ensure that impacts from erosion are less than significant, and no additional mitigation is required.

Impact GS-4: Landslides could be triggered or accelerated due to construction activities (Less than Significant)

As discussed under Impact GS-2, no known landslides are mapped near to or adjacent to the Project. The Ponderosa Borrow Sites are located on gently sloping hillsides mapped with low to moderate landslide susceptibility by San Bernardino County (County of San Bernardino, 2010) and excavation of the sites would be under regulation of a Mining CUP and Reclamation Plan. Compliance with mining regulations combined with the gentle slopes in the borrow sites area ensures that impacts from construction-triggered landslides at the borrow sites would be less that significant. As the remainder of the Project construction is primarily located at and along the dam face and crest, construction would not trigger landslides on the hill slopes in the general Project vicinity. While Project construction, by disturbing the existing dam face, could temporarily increase the potential for slope failure on the dam embankment, design and construction operations will be under the supervision of the DSOD as required by Division 3 of the California Water Code, which would minimize the potential for construction-induced slope failures on the dam. Therefore, impacts from landslides would be less than significant, and no mitigation would be necessary.

Impact GS-5: Expansive soils or other unstable soils could cause damage to Project components, exposing people or structures to potential risk of loss or injury (Less than Significant)

The Project would include construction of a new 40-foot average thickness earthen buttress and placement of new slope protection on the buttress, and excavation of up to two borrow sites. Up to 70,000 cubic yards of material for the buttress would be imported from the Thousand Pines Christian Camp and Papoose Dam stockpiles and the two Ponderosa Borrow Sites. This material would be processed at the dam, stockpile location and borrow sites, and/or the staging area by mixing the stockpile soil with water and other soils of different textures to obtain the optimum moisture content and soil composition. Deleterious materials would be removed from the soil as part of the processing and stockpiled prior to disposal at an appropriate waste facility. This processing of the soil materials and compliance with DSOD standards would ensure that potential impacts from expansive or unsuitable soils would be less than significant. No mitigation would be required.
3.6.4 Level of Significance after Mitigation

Geology and soils impacts would be less than significant, and no mitigation is required. In addition, the Project would have a beneficial impact with regard to hazards from seismically induced ground shaking and liquefaction.
3.7 Hazards and Hazardous Materials

This section describes the potential hazards (other than geologic hazards) associated with the proposed Project site, infrastructure, activities, and materials that could impact human health and the environment. This section also provides the environmental and regulatory settings and discusses mitigation measures to reduce impacts where applicable.

3.7.1 Environmental Setting

Lake Gregory is located in the San Bernardino Mountains in the community of Crestline, approximately 14 miles north of the City of San Bernardino. The Project area is accessible via Lake Drive from Highway 138 to Crestline. The San Bernardino National Forest surrounds Crestline, but the Project site, including the stockpile area and borrow sites at Thousand Pines Christian Camp, are on County and private lands. The majority of the local area has been developed as residential and recreational land uses, and the surrounding landscape is mostly natural open space. None of the Project components would be located on National Forest lands.

Wildfires

The landscape surrounding Lake Gregory consists of native and nonnative vegetation types. Native vegetation in the area includes montane coniferous and riparian forests. The area surrounding the dam consists primarily of open space, residential development, and the various Lake Gregory recreational facilities.

The behavior and characteristics of wildfires are dependent on a number of biophysical and anthropogenic (human-caused) factors. The biophysical variables are fuels (including composition, cover, and moisture content), weather conditions (particularly wind velocity and humidity), topography (slope and aspect), and ignitions (e.g., lightning). The anthropogenic variables are ignitions (e.g., arson, smoking, power lines) and management (wildfire prevention and suppression efforts).

The proposed Project site is located within the Fire Safety Area 1 (FS1) Overlay of the San Bernardino County General Plan Hazards Overlay Map (FH22 B) (SBC, 2014). Development within the Fire Safety Overlay Area is guided by Chapter 82.13 of the County Development Code. The purpose of the overlay is to provide greater public safety in areas prone to wildland brush fires, by establishing additional development standards (Development Code Section 82.13.010). The FS1 overlay is characterized by areas with moderate and steep terrain and moderate to heavy fuel loading contributing to high fire hazard conditions.

Hazardous Materials and Waste

A hazardous material is any substance that, because of its quantity, concentration, or physical or chemical properties, may pose a hazard to human health and the environment. Under Title 22 of the California Code of Regulations (CCR), the term “hazardous substance” refers to both hazardous materials and hazardous wastes. Both of these are classified according to four properties: (1) toxicity; (2) ignitability; (3) corrosiveness; and (4) reactivity (CCR Title 22, Chapter 11, and Article 3). A hazardous material is defined in CCR, Title 22 as:

...A substance or combination of substances which, because of its quantity, concentration, or physical, chemical or infectious characteristics, may either (1) cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness; or
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(2) pose a substantial present or potential hazard to human health or environment when improperly treated, stored, transported or disposed of or otherwise managed (CCR, Title 22, Section 66260.10).

Hazardous materials in various forms can cause death, serious injury, long-lasting health effects, and damage to buildings, homes, and other property. Hazards to human health and the environment can occur during production, storage, transportation, use, or disposal of hazardous materials. Construction and operation of the proposed Project would require the use of limited amounts of various petrochemicals, including fuels, lubricants, and solvents to operate and maintain equipment. At this time, specific quantities of hazardous materials are not known.

3.7.2 Applicable Regulations, Plans, and Standards

Federal

Occupational Safety and Health Administration (OSHA). The OSHA’s mission is to ensure the safety and health of America’s workers by setting and enforcing standards; providing training, outreach, and education; establishing partnerships; and encouraging continual improvement in workplace safety and health. The OSHA staff establishes and enforces protective standards and reaches out to employers and employees through technical assistance and consultation programs. The OSHA standards are listed in Title 29 CFR Part 1910.


State

California Environmental Protection Agency (Cal/EPA). The Cal/EPA was created in 1991, which unified California’s environmental authority in a single cabinet-level agency and brought the Air Resources Board (ARB), State Water Resources Control Board (SWRCB), Regional Water Quality Control Boards (RWQCBs), Integrated Waste Management Board (IWMB), Department of Toxic Substances Control (DTSC), Office of Environmental Health Hazard Assessment (OEHHA), and Department of Pesticide Regulation (DPR) under one agency. These agencies were placed within the Cal/EPA “umbrella” for the protection of human health and the environment and to ensure the coordinated deployment of State resources. Their mission is to restore, protect, and enhance the environment, to ensure public health, environmental quality, and economic vitality.

DTSC is a department of Cal/EPA and is the primary agency in California that regulates hazardous waste, cleans-up existing contamination, and identifies ways to reduce the hazardous waste produced in California. DTSC regulates hazardous waste in California primarily under the authority of the federal Resource Conservation and Recovery Act and the California Health and Safety Code (primarily Division 20, Chapters 6.5 through 10.6, and Title 22, Division 4.5). Other laws that affect hazardous waste are specific to handling, storage, transportation, disposal, treatment, reduction, cleanup, and emergency planning.
Government Code §65962.5 (commonly referred to as the Cortese List), includes DTSC-listed hazardous waste facilities and sites, the DHS lists of contaminated drinking water wells, sites listed by the SWRCB as having UST leaks and that have had a discharge of hazardous wastes or materials into the water or groundwater, and lists from local regulatory agencies of sites that have had a known migration of hazardous waste/material.

**Hazardous Waste Control Act (HWCA).** The HWCA created the State hazardous waste management program, which is similar to, but more stringent than, the federal RCRA program. The act is implemented by regulations contained in Title 26 of the CCR, which describes the following required aspects for the proper management of hazardous waste:

- Identification and classification;
- Generation and transportation;
- Design and permitting of recycling, treatment, storage, and disposal facilities;
- Treatment standards;
- Operation of facilities and staff training; and
- Closure of facilities and liability requirements.

These regulations list more than 800 materials that may be hazardous and establish criteria for identifying, packaging, and disposing of such waste. Under the HWCA and Title 26, the generator of hazardous waste must complete a manifest that accompanies the waste from generator to transporter to the ultimate disposal location. Copies of the manifest must be filed with DTSC.

**Regional Water Quality Control Board (RWQCB).** The RWQCB develops and enforces water quality objectives and implementation plans that protect beneficial uses of the State’s waters. The proposed Project is located within the County of San Bernardino, which is located within the jurisdiction of the Lahontan RWQCB, the primary regulatory agency for stormwater discharges and for sites that impact or have the potential to impact the quality of surface or groundwater.

**California Occupational Safety and Health Administration (Cal/OSHA).** The Cal/OSHA is the primary agency responsible for worker safety in the handling and use of chemicals in the workplace. The Cal/OSHA standards are generally more stringent than federal regulations. The employer is required to monitor worker exposure to listed hazardous substances and notify workers of exposure (8 CCR Sections 337-340). The regulations specify requirements for employee training, availability of safety equipment, accident-prevention programs, and hazardous substance exposure warnings.

- **Hazardous Substance Information and Training (8 CCR Section 339).** Requires listing and implementation of specified control measures for management of hazardous substances.

**Local**

**County of San Bernardino General Plan**

Safety Element

**GOAL S1.** The County will minimize the potential risks resulting from exposure of County residents to natural and man-made hazards in the following priority: loss of life or injury, damage to property, litigation, excessive maintenance and other social and economic costs.
Policy S1.3  Support and expand emergency preparedness and disaster response programs and establish comprehensive procedures for post-disaster planning in affected areas.

Programs
1. Continue to fund and staff the existing Office of Emergency Services and maintain and update the Emergency Preparedness Management Plan.
2. Continue coordination with public and private agencies and initiate coordination in residential areas through Neighborhood Watch, homeowners associations and other neighborhood groups.
3. Provide for the needs of dependent and immobile populations in emergency response and recovery operations through identification and prioritization of rescue needs.
4. Require disaster plans and provisions in the design, location, and management of all public facilities.
5. Plan, design, and use public facilities according to the requirements of the County Emergency Management Plan.
6. Ensure adequate access routes to and from potential devastation areas as required by the County’s Emergency Management Plan.
7. Establish a standing committee for disaster recovery to plan for a disaster by providing contingency planning for the rapid and effective reconstruction of affected areas. The committee will include representatives of Planning, Public Works, Community Development and Housing, and Building and Safety, as well as liaison to the local utilities and any state and federal redevelopment, housing and reconstruction programs.

GOAL S2. The County will minimize the generation of hazardous waste in the County and reduce the risk posed by storage, handling, transportation, and disposal of hazardous wastes.

Policy S2.1  Because reducing the amount of waste generated in this County is an effective mechanism for reducing the potential impact of these wastes on the public health and safety and the environment, and because legislation encourages the reduction, to the extent feasible, of hazardous waste, this jurisdiction will encourage and promote practices that will, in order of priority: (1) reduce the use of hazardous materials and the generation of hazardous wastes at their source; (2) recycle the remaining hazardous wastes for reuse; and (3) treat those wastes that cannot be reduced at the source or recycled. Only residuals from waste recycling and treatment will be land disposed.

Policy S2.5  Minimize the risk of exposure to hazardous substances by residential and other sensitive receptors through the application of program review and permitting procedures.

Programs
1. The County shall provide 24-hour response to emergency incidents involving hazardous materials or wastes in order to protect the public and the environment from accidental releases and illegal activities.
2. The County shall operate collection facilities and events for residents of San Bernardino County to safely dispose of household hazardous waste.
3. The County shall provide affordable waste management alternatives to businesses that generate very small quantities of waste through the Conditionally Exempt Small Quantity Generator program.
4. The County shall inspect hazardous material handlers and hazardous waste generators to ensure full compliance with laws and regulations.

5. The County shall implement CUPA [Certified Unified Program Agencies] programs for the development of accident prevention and emergency plans, proper installation, monitoring, and closure of USTs, and the handling, storage, transportation, and disposal of hazardous wastes.

6. The County shall conduct investigations and take enforcement action as necessary for illegal hazardous waste disposal or other violations of federal, state, or local hazardous materials laws and regulations.

7. The County shall manage the investigation and remediation of environmental contamination due to releases from USTs [underground storage tanks], hazardous waste containers, chemical processes, or the transportation of hazardous materials.

8. The County shall provide access to records for potential buyers of property to perform due diligence research and environmental assessment.

9. The County shall use the County’s Certificate of Occupancy process to address identification of new facilities that may handle hazardous materials, including facilities subject to the California Accidental Release Prevention Program, accordance with Government Code 65850.2.

GOAL S5. The County will provide adequate flood protection to minimize hazards and structural damage.

Policy S5.3 Protect residents and properties from the risk of dam failure as a result of earthquake or other causes.

Programs
1. Require an engineering geology report for all new or proposed public and private reservoirs. This report will be completed by a registered engineering geologist, conform to County standards, and be approved by the County Geologist.

2. Include reservoirs as Dam Inundation areas on the Hazard Overlay Maps as required by the State of California.


4. Prohibit critical, essential and high-risk land uses from Dam Inundation areas as shown on the Hazard Overlay Maps and Figure II-4.

Policy S5.4 Protect existing development in floodways and floodplains.

Programs
1. Continue to identify natural drainage courses and designate San Bernardino County Drainage Easements as a means to preserve natural drainage flow paths and/or constructed drainage facilities.

2. Require implementation of flood protection measures when additions valued at 25 percent or greater of the original structure are proposed.

3. Establish funding mechanisms when flood control facilities are warranted.
Policy S5.6 Prevent flood hazard resulting from drainage from adjacent development.

Programs
1. The run-off provisions of the Erosion and Sediment Control Ordinance will apply countywide.
2. Surface run-off from new development will be controlled by onsite measures including but not limited to structural controls. Restrictions regarding changes in topography, removal of vegetation, creation of impervious surfaces and periods of construction, such that the need for off-site flood and drainage control improvements is minimized and that run-off from the development will not result in downstream flood hazards.

Policy S5.8 Design flood control and drainage measures as part of an overall community improvement program that advances the goals of recreation, resource conservation, preservation of natural riparian vegetation and habitat, and the preservation of the scenic values of the County’s streams and creeks.

Programs
1. Consider ecological significance and aesthetic quality of natural drainage ways in the design of all drainage projects.
2. Require that storm waters be used for groundwater recharge when possible and that existing groundwater recharge areas be considered for retention as unbuilt open areas.
3. Preserve all existing “unlined” and “natural” drainage channels and water courses, such as creeks and river beds, as resource management areas or linear parks and recreation trails, whenever technically and economically feasible. Linear parks and/or recreation trails will be part of a master-planned system.

Policy S5.9 Coordinate with local, regional, state, federal, and other private agencies to provide adequate flood protection to County residents.

Programs
1. Continue the development of intergovernmental coordination with cities, adjacent counties, the Army Corps of Engineers, and other agencies that have an interest in flood control projects that cross jurisdictional boundaries.
2. Coordinate land use and flood control planning through continued improvement of staff contacts between the Land Use Services Department, Flood Control District, Special Districts Department, and cities within the County, and through annual review of the Capital Improvements Program.

GOAL S9. The County’s emergency evacuation routes will quickly and efficiently evacuate all residents in the event of wildland fires and other natural disasters, and will ensure adequate access of emergency vehicles to all communities.

Policy S9.1 Maintain projected emergency access needs in the periodic review of the County's Hazard Mitigation Plan.

Programs
1. The Office of Emergency Services (OES), County Fire Department shall be responsible for the continued update of emergency evacuation plans for wildland fire incidents as an extension of the agency’s responsibility for Hazard Mitigation Planning in San Bernardino County. OES
shall update evacuation procedures in coordination with MAST and provide specific evacuation plans for the Mountain Region where route planning, early warning and agency coordination is most critical in ensuring proper execution of successful evacuations. OES will monitor population growth and evaluate road capacities and hazard conditions along evacuation corridors to prepare contingency plans to correspond to the location, direction and rate of spread of wildland fires.

GOAL S10. San Bernardino County will provide a Hazard Mitigation Plan (HMP) with the intent to reduce and/or eliminate risk that may result in loss of life and property.

Policy S10.1 Prepare a Multi-Jurisdictional Hazard Mitigation Plan that assists in developing sustainable, self-reliant, disaster-resistant communities within San Bernardino County. By this policy, the Hazard Mitigation Plan shall be part of this Safety Element of the San Bernardino County General Plan.

Programs

1. The Office of Emergency Services shall organize and preside over a coalition of local jurisdictions governed by the Board of Supervisors, participating agencies, pertinent stakeholders and emergency responders in the preparation of a comprehensive Multi-Jurisdictional Hazard Mitigation Plan that is regional in nature.

2. The Office of Emergency Services shall develop a San Bernardino County Planning Team to participate in the development and implementation of the Multi-Jurisdictional Hazard Mitigation Plan to include, but not limited to:
   a. The County,
   b. The County Fire Department/Fire Protection District,
   c. The Flood Control District,
   d. The Special Districts Department,
   e. The Land Use Services Department,
   f. The Big Bear Recreation and Parks District, and
   g. The Bloomington Recreation and Parks District.

Policy S10.2 The San Bernardino County Planning Team shall meet annually to review the status of the Multi-Jurisdictional Hazard Mitigation Plan and all associated projects and take necessary actions to ensure compliance with the Plan.

Programs

1. Complete pre-disaster and post-disaster actions required by the plan as funding and circumstances permit.

2. Analyze the current situation annually at the San Bernardino County Planning Team meeting to add, remove, or modify projects as projects are completed, identified, or project priorities/rankings are changed by the individual jurisdictions/departments responsible for the projects.

3. Track all projects including those completed, in progress, waiting funding, in planning and development stage, or projects removed from lists for any reason. Project tracking shall be included in the next update cycle of the Multi-Jurisdictional Hazard Mitigation Plan.

Policy S10.3 Every five years, starting with the latest FEMA Approval Date for the MJHMP, submit completed necessary revisions, updates and additions to the latest FEMA approved Multi-
Jurisdictional Hazard Mitigation Plan. Plan updates will be a joint project of the County Planning Team with input from the public as indicated in the Federal Emergency Management Agency guidance documents.

Policy S10.4 After disasters, complete the necessary repairs and reconstruction as quickly as possible as funding permits to restore a sense of normalcy to the affected communities while following the guidelines established by the Multi-Jurisdictional Hazard Mitigation Plan and other plans, regulations and laws that apply.

**Mountain Region Goals and Policies of the Safety Element**

**GOAL M/S1.** The County’s emergency evacuation routes will quickly and efficiently evacuate all residents in the event of wildland fires and other natural disasters, and will ensure adequate access of emergency vehicles to all communities.

**Policy M/S1.1** Designate the following roads and highways as evacuation routes in the in the Mountain Region: State Highways 2, 18, 38, 138, 189 and 330, and Mount Baldy Road.

**Programs**

1. The Office of Emergency Service (OES), County Fire Department shall be responsible for the continued update of emergency evacuation plans for wildland fire incidents as an extension of the agency’s responsibility for Hazard Mitigation Planning in San Bernardino County. OES shall update evacuation procedures in coordination with MAST and provide specific evacuation plans for the Mountain Region where route planning, early warning and agency coordination is most critical in ensuring proper execution of successful evacuations. OES will monitor population growth and evaluate road capacities and hazard conditions along evacuation corridors to prepare contingency plans to correspond to the location, direction and rate of spread of wildland fires.

**Crest Forest Community Plan**

**Safety**

**Goal CF/S2.** Ensure that emergency evacuation routes will adequately evacuate all residents and visitors in the event of a natural disaster.

**Policy CF/S2.1** Work with the Public Works Department and Caltrans to ensure that an adequate road system, and proper access, are provided to ensure safe and efficient evacuation for residents and visitors of the mountain communities.

**Policy CF/S2.2** Work with the various fire agencies, the Fire Safe Councils, Caltrans, the United States Forest Service, and the community in the development of Community Wildfire Protection Plans (CWPP) for the mountain communities. As part of this effort, a study shall be prepared to determine appropriate forest management techniques and identify any necessary modifications to the County’s Tree Preservation Ordinance to ensure the long term health of the forest.

**Goal CF/S3.** Support and coordinate disaster planning with affected agencies and organizations.

**Policy CF/S3.1** Work with local, state, federal, and other agencies involved in disaster preparedness.

**Policy CF/S3.2** Provide an emergency response system that is both efficient and economical.
3.7.3 Environmental Impacts and Mitigation Measures

This section analyzes the impacts associated with implementation of the proposed Project related to the risk of upset due to potential hazardous substances, including hazardous materials and hazardous waste within the proposed Project area and the vicinity, as well as other hazards to public safety. The impact analysis describes the methods used to determine the proposed Project’s impacts and lists the thresholds used to conclude the significance of an impact. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, as needed.

Impact Assessment Methodology

The methodology for analyzing impacts related to hazards and hazardous materials include identifying general types of hazardous materials and techniques that are likely to be used during proposed Project construction, operation, and maintenance activities. Federal, State, and local agency laws, ordinances, regulations, and standards were analyzed to determine any mandated mitigation measures applicable to the proposed Project site. The existing hazardous materials sites analyzed for the proposed Project are those located within 0.5 mile of the proposed Project boundary that have known environmental contamination, those that have underground storage tanks, or those that store, use, or dispose of hazardous materials with reported incidents of spills or violations. These are sites with the potential to have resulted in environmental contamination on the proposed Project site.

Thresholds of Significance

The significance of potential hazards and hazardous materials impacts were determined based on relevant State CEQA Guidelines, Appendix G. Using these thresholds, the proposed Project would be considered to have a significant impact if it would:

- **HAZ-1**: Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
- **HAZ-2**: Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.
- **HAZ-3**: Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 1/4 mile of an existing or proposed school.
- **HAZ-4**: Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.
- **HAZ-5**: Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

The following thresholds from the CEQA Appendix G Environmental Checklist are not relevant to the proposed Project and are not discussed further beyond the summary below:

- **VIII (d)** Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment.

The proposed Project site is not located on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5, as retrieved on June 4, 2015 (DTSC, 2015). Therefore, the proposed
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Project would not create a significant hazard to the public or the environment, and there would be no impact related to CEQA Threshold VIII (d).

- **VIII (e)** For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area.

  The proposed Project site is not located within an airport influence area or within an airport compatibility zone as identified in General Plan Hazards Map FH22 B (SBC, 2010). No private airstrips occur in the vicinity of the proposed Project site. Implementation of the proposed Project would not result in a safety hazard related to an airport land use plan or resulting from the use of an airstrip in the immediate Project area, and there would be no impact related to CEQA Threshold VIII (e).

- **VIII (f)** For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area.

  No private airstrips occur in the vicinity of the proposed Project site. Implementation of the proposed Project would not result in a safety hazard for people residing or working in the Project area due to the Project’s location within the vicinity of a private airstrip. No impact would occur related to CEQA Threshold VIII (f).

**Project Impacts**

**Impact HAZ-1:** The Project could create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (Less than Significant with Mitigation)

The proposed Project includes the construction of physical improvements to the dam; earthen material excavation, hauling and processing; relocation of utilities on Lake Drive; and interim traffic detour routes. Construction of the buttress would require removal of mature trees, vegetation, and rock from the downstream slope of the dam, and removal of foundation material at the base of the dam. A drainage system would be installed to drain water from the liquefaction zone, and slope protection would also be installed on the new buttress.

Potentially hazardous materials used during construction would likely consist of gasoline, diesel fuel, motor oil, hydraulic fluids, and various lubricants. On-site re-fueling would likely occur for construction vehicles and small oil spills may occur during this process. The potential environmental effects from fueling operations are expected to be limited to small areas of contaminated soil. No on-site fuel storage would occur.

Should any hazardous material(s) be spilled or encountered during Project implementation, the material(s) would be contained, removed, and treated in accordance with standard County contract specifications and requirements, as well as federal, State, and local laws, regulations, and ordinances.

Herbicides may be used for vegetation control, which could result in significant adverse health effects to the public, maintenance personnel, wildlife, or sensitive vegetation if herbicides are handled improperly or chemical drift occurs away from the Project area. Mitigation Measure (MM) HAZ-1 requires that the contractor or personnel applying herbicides would have all the appropriate State and local herbicide applicator licenses and comply with all State and local regulations regarding herbicide use. Herbicides would be mixed and applied in conformance with the product manufacturer’s directions. The herbicide applicator would be equipped with splash protection clothing and gear, chemical resistant gloves, chemical spill/splash wash supplies, and material safety data sheets for all hazardous materials to be used. To minimize harm to wildlife, vegetation, and waterbodies, herbicides would be applied directly to target
vegetation, products identified as non-toxic to birds and small mammals would be used, and herbicides would not be applied within 50 feet of any surface waterbody when water is present. Herbicides would not be applied if it is raining at the site, rain is imminent, or the target area has puddles or standing water. Herbicides would not be applied when wind velocity exceeds ten (10) miles per hour. If spray is observed to be drifting to a non-target location, spraying would be discontinued until conditions causing the drift have abated. The practices described above and included in Mitigation Measure (MM) HAZ-1 would ensure that herbicide use would not pose a significant hazard to personnel or the environment.

With the implementation of MM HAZ-1, the proposed Project would not create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials. Impacts would be less than significant.

**Mitigation Measure**

**MM HAZ-1 Licensed Herbicide Applicator.** Prior to the issuance of grading or building permits, if herbicides are utilized, the contractor or personnel applying herbicides must have all the appropriate State and local herbicide applicator licenses and comply with all State and local regulations regarding herbicide use. Herbicides shall be mixed and applied in conformance with the product manufacturer’s directions. The herbicide applicator shall be equipped with splash protection clothing and gear, chemical resistant gloves, chemical spill/splash wash supplies, and material safety data sheets for all hazardous materials to be used. To minimize harm to wildlife, vegetation, and waterbodies, herbicides shall not be applied directly to wildlife, products identified as non-toxic to birds and small mammals shall be used if nests or dens are observed, and herbicides shall not be applied within 50 feet of any surface waterbody when water is present. Herbicides shall not be applied if it is raining at the site, rain is imminent, or the target area has puddles or standing water. Herbicides shall not be applied when wind velocity exceeds ten (10) miles per hour. If spray is observed to be drifting to a non-target location, spraying shall be discontinued until conditions causing the drift have abated.

**Impact HAZ-2:** The Project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment (Less than Significant with Mitigation)

Potentially hazardous materials used during construction would likely consist of gasoline, diesel fuel, motor oil, hydraulic fluids, and various lubricants. On-site re-fueling would likely occur for construction vehicles and small oil spills may occur during this process. Should any hazardous material(s) be spilled or encountered during Project implementation, the material(s) would be contained, removed and treated in accordance with standard County contract specifications and requirements, as well as federal, State, and local laws, regulations, and ordinances.

Grading or excavation at the proposed Project site and borrow sites also has the potential to mobilize any hazardous materials currently in the soil, which could result in exposure of personnel and other sensitive receptors such as plants and wildlife to contaminant levels that could result in short-term or long-term health effects. MM HAZ-2 would reduce potential impacts by requiring the construction contractor to stop work if suspected contamination is identified, cordon off areas of suspected contamination, take appropriate health and safety measures, have a trained individual conduct sampling and testing or suspected material, and, if contamination is found to be greater than regulatory limits, notify the San Bernardino County Department of Public Health and document all actions.
There is also the potential for hazardous materials being used at the proposed Project site to be released into washes and streams in the proposed Project area. MM HAZ-3 would require hazardous materials use to occur at a distance from watercourses, which would reduce the potential for any spilled materials to enter watercourses.

With the implementation of MMs HAZ-2 and HAZ-3, the proposed Project would not create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Impacts would be less than significant.

Mitigation Measures

MM HAZ-2  
**Response to Contamination.** If, during grading or excavation work, the contractor observes visual or olfactory evidence of contamination or if soil contamination is otherwise suspected, work near the excavation site shall be terminated, the work area cordoned off, and appropriate health and safety procedures implemented for the location by the contractor’s Health & Safety Officer. Samples shall be collected by an Occupational Safety and Health Administration-trained individual with a minimum of 40 hours of hazardous material site worker training. Laboratory data from suspected contaminated material shall be reviewed by the contractor’s Health and Safety Officer. If the sample testing determines that contamination is not present, work may proceed at the site; however, if contamination is detected above regulatory limits, the San Bernardino County Department of Public Health shall be notified. All actions related to encountering unanticipated hazardous materials at the site shall be documented and submitted to the San Bernardino County Department of Public Health.

MM HAZ-3  
**Siting of Hazardous Materials.** Prior to the issuance of grading or building permits, the San Bernardino County Special Districts Department shall provide evidence that all fueling, hazardous materials storage areas, and operation and maintenance activities involving hazardous materials will be sited at least 100 feet away from blue-line drainages, as identified on U.S. Geological Survey topography maps and wetlands.

**Impact HAZ-3:** The Project could emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school (Less than Significant)

The nearest school to the proposed Project site is the Lake Gregory Education Center (Lake Gregory Elementary School and Mountain High School), located at 24740 San Moritz Way in Crestline, approximately 0.25 mile east-southeast of the proposed Project site. Any potential leakage or spillage during construction, operations, or maintenance would be confined to the immediate area of the proposed Project site. Due to the constructed prevention measures in place, any spillage of oil, diesel fuel, or other hazardous material should not run off the proposed Project site into the surrounding environment. Therefore, the proposed Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. Impacts would be less than significant, and no mitigation is required.

**Impact HAZ-4:** The Project could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan (Less than Significant with Mitigation)

The Crest Forest Community Plan Safety Chapter identifies the evacuation routes for the community in the event of potential fire or other natural disaster events. The following roadways are identified in the plan as designated evacuation routes: SR-138, SR-18, SR-189, Waters Drive, Crest Forest Drive, Knapps Cutoff, Lake Gregory Drive, Arosa Drive, San Moritz Drive, North Road, and Lake Drive. Lake Gregory Drive,
Lake Drive, and San Moritz Drive are located in the immediate Project vicinity and all provide access to the Lake Gregory Regional Park recreation area. In addition, Project haul routes would include portions of Lake Gregory Drive and Lake Drive. Per the Crest Forest Community Plan, in the event of an emergency, specific evacuation routes would be designated during an emergency in order to respond to the specific needs of the situation and circumstances surrounding the disaster.

The proposed Project site is also located within the planning area for the Lake Gregory Dam Emergency Action Plan (EAP). The purpose of the EAP is to reduce risk and loss of human life and injury, and to minimize property damage in the event of an emergency situation associated with the Lake Gregory Dam. Potential emergency situations as identified in the plan may include: dam instability, felt earthquakes, extreme storm events, major spillway releases, overtopping of the dam, outlet system failure, abnormal instrumental readings, vandalism or sabotage, spillway gate failures, or failure of the dam. The plan establishes guidelines that should be followed for identification of emergency situations and action protocols in the event of an emergency.

During the construction of the proposed Project, heavy construction-related traffic could interfere with emergency response to the site or emergency evacuation procedures in the event of an emergency such as a wildfire. Heavy construction-related traffic could also potentially interfere with emergency response to residences located within one mile of the proposed Project. To ensure emergency access to the site during construction, MM TR-4, as described in Section 3.13 (Traffic and Transportation) of this EIR, requires coordination with emergency service providers. Additionally, MM HAZ-5 would reduce the significance of this impact by ensuring coordination between emergency responders and construction crews and by establishing emergency procedures for access to the proposed Project site in the event of an emergency. With the implementation of mitigation measures, the proposed Project would not impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan, and impacts would be less than significant.

Mitigation Measures

**MM TR-4 Coordinate with Emergency Service Providers.** See Section 3.13 (Traffic and Transportation) for the full text of this measure.

**MM HAZ-4 Emergency Response Liaison.** Prior to the issuance of grading or building permits, the San Bernardino County Special Districts Department shall appoint an Emergency Response Liaison to coordinate the reduction of construction-related traffic for the duration of any emergency at or nearby the proposed Project site. The San Bernardino County Fire Department, San Bernardino County Sheriff’s Department, the San Bernardino County Department of Public Works, and the California Highway Patrol shall be provided with the construction schedule and the on-site contact information for the Liaison prior to construction. The Liaison shall be immediately reachable at all times during proposed Project construction. The Liaison shall have radio contact with Project construction vehicles at all times to coordinate traffic reduction measures. In addition, the Liaison shall coordinate with the San Bernardino County Fire Department, the San Bernardino County Sheriff's Department, the San Bernardino County Department of Public Works, and the California Highway Patrol to establish emergency procedures for access to the proposed Project site in the event of emergency.
Impact HAZ-5: The Project could expose people or structures to a significant risk of loss, injury, or death involving wildland fires (Less than Significant)

The proposed Project site is located within the Fire Safety Area 1 (FS1) Overlay of the San Bernardino County General Plan Hazards Overlay Map FH22 B (SBC, 2010). Development within the Fire Safety Overlay Area is guided by Chapter 82.13 of the County Development Code. The purpose of the overlay is to provide greater public safety in areas prone to wildland brush fires, by establishing additional development standards (Development Code Section 82.13.010). The FS1 overlay is characterized by areas with moderate and steep terrain and moderate to heavy fuel loading contributing to high fire hazard conditions. The Development Code requires that a notice of application or permit for development in FS areas be sent to the responsible Fire Authority for comment. Additionally, all development within FS areas must comply with development standards as outlined in Section 82.13.050 and 82.13.060 of the Development Code. Fire Authority Standards include compliance with standards required by the Responsible Fire Authority and compliance with standards and provisions of the California Building Code Chapter 7A (Materials and Construction Methods for Exterior Wildfire Exposure).

Construction of the proposed Project would include the use of motorized vehicles and equipment in and adjacent to forest areas. Sparks or heat from vehicle and equipment engines could potentially result in the ignition of a wildland fire. However, the proposed Project would be constructed in accordance with standard safety measures as part of the County Development Code, and would not introduce a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. Impacts would be less than significant and no mitigation is required.

3.7.4 Level of Significance After Mitigation

Compliance with applicable regulations and standards would result in less than significant impacts related to hazardous materials near schools, and wildland fires. All other impacts would be reduced to less than significant with the implementation of mitigation measures.
3.8 Hydrology and Water Quality

This section describes hydrological and water quality conditions in the proposed Project area and analyzes environmental impacts that would result from the Project. The following discussion addresses existing environmental conditions in the affected area and identifies and analyzes environmental impacts from Project construction and operation. In addition, existing laws and regulations relevant to hydrology and water quality are described. In some cases, compliance with these existing laws and regulations would serve to reduce or avoid certain impacts that might otherwise occur with the implementation of the Project.

3.8.1 Environmental Setting

This section provides an overview of the affected environment for hydrology and water quality including surface water resources and groundwater resources for the study area. Hydrology and water quality resources are described in terms of topography and climate, watersheds and surface waters, floodplains, groundwater, and water quality.

Topography and Climate

Lake Gregory Dam is located in the hilly terrain of the San Bernardino Mountains north of San Bernardino, California (USGS, 2012). The crest of the dam is at 4,530 feet above mean sea level. At the crest elevation, the water surface of the lake occupies 88 acres (DWR, 2014). The area surrounding the lake is hilly and developed for residential use by the community of Crestline.

Based on data from nearby Lake Arrowhead, the climate is characterized by cool winters and warm summers. Average annual precipitation is approximately 40 inches, with snow common in the winter. Precipitation is seasonal, with 82 percent of all precipitation falling between November and March (WRCC, 2014).

Watersheds and Surface Waters

Lake Gregory is a man-made reservoir, with a capacity of 2,100 acre-feet, located in the community of Crestline, San Bernardino County, California. The Lake Gregory Dam is on Houston Creek, a perennial mountain stream with average annual discharge downstream of the dam approximately 3 cubic feet per second (cfs). Runoff follows a seasonal pattern similar to rainfall. Highest flows (average daily flow 7.3 cfs in January) are during the winter months and lowest flows (average daily flow 0.1 cfs in July) are in the summer months (USGS, 2014). The watershed area at Lake Gregory Dam is 2.8 square miles (DWR, 2014) and consists of large stands of ponderosa pines and other vegetation typical of the high mountain terrain, and the urban community of Crestline (Albert A. Webb Associates, 2013). Outflows from the lake flow into Houston Creek via the dam spillway and a diversion tunnel. Houston Creek is in a natural condition downstream of the dam, and is tributary to the Mojave River approximately 2.4 river miles downstream of Lake Gregory. The Mojave River discharges into Lake Silverwood approximately 2.2 miles downstream of the confluence with Houston Creek (Figure 3.8-1). Lake Silverwood is a water-supply lake owned by the California Department of Water Resources, serving as a regulating reservoir along the East Branch of the California State Water Project (MWA, 2014). The lake is maintained by imported water from the State Water Project. Natural surface inflows are allowed to pass through the lake to maintain natural flow in the Mojave River (MWA, 2014). Silverwood Lake currently supplies 80 percent of the municipal water used by the community of Crestline through the Crestline Village Water District (CVWD, 2014a).
There is currently a minor amount of seepage through the dam and into the bed of Houston Creek. At the time of a site visit made in March of 2014 the seepage visibly extended roughly 240 feet downstream of the dam.

**Floodplains**

Federal Emergency Management Agency (FEMA) 100-year (regulatory) floodplain maps are available for Lake Gregory and a portion of Houston Creek upstream of the lake, but not for Houston Creek downstream of the dam (FEMA, 2008). The floodplain covers Lake Gregory itself to an elevation of 4533.1 feet (3.1 feet higher than the spillway crest).

The San Bernardino County Lake Gregory Emergency Action Plan (Tetra Tech, 2011) includes maps of the area potentially inundated by the failure of the Lake Gregory Dam (see Appendix 6 for inundation mapping). This floodplain extends from the dam downstream to Lake Silverwood. The Mojave River dam failure floodplain contains several buildings and roads, mostly near the confluence with Houston Creek, but is otherwise mostly in a natural condition and contained by the canyon walls.

**Groundwater**

Lake Gregory Dam is located in consolidated basement rock of the San Bernardino Mountains and not located in a groundwater basin as identified by the California Department of Water Resources (DWR, 2004). However, groundwater does occur in the Project area, primarily as seepage through the dam embankment and a natural spring. A spring observed along the right downstream groin during DSOD site inspection in June 1985 was noted as “historical and not reservoir related” (page 4-1, DSOD, 1986). Leakage through the dam outlet tunnel was also noted during the June 1985 DSOD inspection and estimated to be 8 to 10 gallons per minute (gpm) (page 4-1, DSOD, 1986). Seepage at 0 to 5 gpm emanating from shears and joints in the bedrock exposed in the unlined outlet tunnel was noted during a 2009 reconnaissance (TetraTech, 2012 [Appendix 5d]). Three piezometers installed in geotechnical borings drilled in 2011 along the dam crest reveal groundwater occurs at depths of 25 to 37 feet below the dam crest. The piezometric surface through the dam embankment slopes steeply from elevation 4,505 feet on the upstream face to about elevation 4,445 feet at the downstream face (TetraTech, 2012 [Appendix 5d]).

Groundwater is a significant component of the local municipal supply for Crestline Village Water District (CVWD). All of CVWD’s groundwater is produced from fractured bedrock aquifers in the Crestline-Lake Gregory area and provided 425 to 598 acre-feet during 2006 to 2010, representing 47 to 70 percent of the total annual supply (CVWD, 2013).

**Water Quality**

The Water Quality Control Plan for the Lahontan Region assigns the following beneficial uses to Lake Gregory (LRWQCB, 1995): municipal supply, agricultural supply, groundwater recharge, navigation, contact and non-contact recreational uses, commercial and sport fishing, cold freshwater habitat, wildlife habitat, and spawning, reproduction, and development. Houston Creek has the following beneficial uses: municipal supply, agricultural supply, contact and non-contact recreational uses, commercial and sport fishing, cold freshwater habitat, and wildlife habitat (LRWQCB, 1995). Lake Gregory water quality is sufficient to be used for contact water recreation. Lake Gregory and Houston Creek are not listed as impaired by the State Water Resources Control Board (SWRCB, 2014).

There are no site-specific water quality data available for the Lake Gregory Dam groundwater piezometers. However, the annual water quality reports prepared by CVWD reveal that the District’s wells
produce high-quality water with low hardness and meet all Primary and Secondary drinking water standards set by California Department of Public Health (CVWD, 2014b). It is reasonable to assume that the water quality of the spring located downstream of the dam is similar high-quality water.

### 3.8.2 Applicable Regulations, Plans, and Standards

**Federal**

**Clean Water Act** (CWA) (33 U.S.C. Section 1251 et seq.). Formerly the Federal Water Pollution Control Act of 1972, the CWA was enacted with the intent of restoring and maintaining the chemical, physical, and biological integrity of the waters of the United States. The CWA requires states to set standards to protect, maintain, and restore water quality through the regulation of point source and certain non-point source discharges to surface water. Those discharges are regulated by the National Pollutant Discharge Elimination System (NPDES) permit process (CWA Section 402). NPDES permitting authority is administered by the California State Water Resources Control Board (SWRCB) and its nine Regional Water Quality Control Boards (RWQCB). The proposed Project is within the area administered by the Lahontan Regional Water Quality Control Board.

The proposed Project would be required to obtain NPDES coverage under the California General Permit for Discharges of Storm Water Associated with Construction Activity. The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) describing Best Management Practices (BMPs) the discharger would use to protect stormwater runoff. The SWPPP must contain a visual monitoring program and a chemical monitoring program for “non-visible” pollutants to be implemented if there is a failure of BMPs.

Section 401 of the CWA requires that any activity that may result in a discharge into waters of the U.S. be certified by the RWQCB. This certification ensures that the proposed activity not violate State and/or federal water quality standards. The proposed Project is expected to result in discharges to waters of the U.S., and would require Section 401 certification.

Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (USACE) to regulate the discharge of dredged or fill material to the waters of the U.S. and adjacent wetlands. Discharges to waters of the U.S. must be avoided where possible, and minimized and mitigated where avoidance is not possible. The USACE issues individual site-specific or general (Nationwide) permits for such discharges. A preliminary determination has been made that portions of the proposed Project are within federal jurisdictional waters. Permitting under Section 404 of the CWA would be required. This issue is addressed further in Section 3.4.

**National Flood Insurance Act/Flood Disaster Protection Act.** The National Flood Insurance Act of 1968 led to mapping of regulatory floodplains for flood insurance purposes, and to federal requirements for local management of floodplain areas. Communities participating in the National Flood Insurance Program, which include San Bernardino County, agree to adopt and enforce ordinances that meet or exceed FEMA requirements to reduce the risk of flooding.

**State**

**California Streambed Alteration Agreement.** Sections 1600–1616 of the California Fish and Game Code require that any entity that proposes an activity 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 material where it may pass into any river, stream, or lake, must notify the California Department of Fish and Wildlife (CDFW). If the CDFW determines the alteration may
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adversely affect fish and wildlife resources, a Lake or Streambed Alteration Agreement (LSAA) will be
prepared. The LSAA includes conditions necessary to protect those resources. The Agreement applies to
any stream including ephemeral streams and desert washes.

California Porter Cologne Water Quality Control Act. The Porter Cologne Water Quality Control Act of
1967, Water Code Section 13000 et seq., requires the SWRCB to adopt water quality criteria to protect
State waters. Waters of the State are defined by the Porter Cologne Water Quality Control Act as “any
surface water or groundwater, including saline waters, within the boundaries of the State.” The Lahontan
RWQCB (LRWQCB, 1995) has developed a Water Quality Control Plan (Basin Plan) specifying water quality
objectives, beneficial uses, numerical standards of pollution concentrations, and implementation
procedures for Waters of the State. The water quality control plan is intended to protect designated
beneficial uses of waters, avoid altering the sediment discharge rate of surface waters, and avoid
introducing toxic pollutants to the water resource.

California Water Code. Division 3 of the California Water Code authorizes the California Department of
Water Resources (DWR) to regulate the construction, maintenance and repair of dams to protect people
against the loss of life and property from dam failure. Dam repairs are reviewed by and must conform to
specifications of the DWR to ensure safety. The Lake Gregory dam is under the jurisdiction of the California
State Department of Water Resources Division of Safety of Dams (DSOD). Repair plans would be reviewed
and accepted by DSOD.

Local

Crestline Village Water District Ordinance No. 29, Ordinance No. 30, and Ordinance No. 35. Crestline
Village Water District Ordinance No. 29 and Ordinance No. 30 implement water conservation programs
during severe draught that includes provisions to restrict water use and prohibit water waste during
periods of water supply shortage. Effective September 1, 2014, the District adopted Ordinance No. 35 that
modifies the Water Conservation Plan to a mandatory 5 percent reduction in water use.

County of San Bernardino General Plan. The dam spillway and downstream Houston Creek would qualify
as a Floodway Land Use Zoning District under the County of San Bernardino General Plan. The Floodway
Land Use Zoning District is intended to preserve areas for flood flow, prevent encroachment or
construction of structures therein, and prevent the loss of life and property due to flooding. The Project
conforms to these uses.

General Plan Goal CO 5 states “The County will protect and preserve water resources for the maintenance,
enhancement, and restoration of environmental resources. The proposed Project is consistent with the
policies enacted to achieve this goal.

General Plan Goal M/CO 3 is to “Conserve and protect surface and groundwater resources to meet the
needs of a growing mountain population, to support the mountain environment and forest watershed
and to preserve the quality of life for mountain residents and visitors. The proposed Project is consistent
with the policies enacted to achieve this goal.

3.8.3 Environmental Impacts and Mitigation Measures

Thresholds of Significance

The impact analysis describes conclusions regarding the nature and significance of each identified impact
that would result from the proposed Project. Appropriate criteria have been identified and utilized to
make these significance conclusions based on the CEQA Appendix G Environmental Checklist, adjusted for
relevance to this analysis based on local conditions and the Project description. For purposes of the CEQA analysis in this analysis, hydrology impacts are considered significant if the proposed Project would:

- **HW-1**: Violate water quality standards or waste discharge requirements, provide substantial additional sources of polluted runoff, or otherwise substantially degrade or diminish surface water quality, by introducing pollutants to surface waters of Houston Creek or Lake Gregory.

- **HW-2**: Alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site.

- **HW-3**: Create a flood hazard.

- **HW-4**: Substantially deplete groundwater supplies or interfere with groundwater recharge, such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted).

**Impact Assessment Methodology**

The impact analysis is based on an assessment of baseline conditions relevant to the site climate, topography, watersheds and surface waters, groundwater, floodplains, and water quality, presented in Section 3.8.1. These baseline conditions were evaluated based on their potential to be affected by construction activities as well as operation and maintenance activities related to the proposed Project. Potential impacts were then identified based on the predicted interaction between construction, operation, and maintenance activities with the affected environment, and the impact significance criteria described above.

Impacts are described in terms of location, context and intensity, and identified as being either short- or long-term, or direct and indirect in nature. Beneficial as well as adverse impacts are identified, with a discussion of the effect and risk to public health and safety. Mitigation measures, where necessary, are developed to avoid, minimize, or rectify impacts.

**Project Impacts**

**Impact HW-1**: Construction could violate water quality standards or waste discharge requirements, provide substantial additional sources of polluted runoff, or otherwise substantially degrade or diminish surface water quality, by introducing pollutants to surface waters of Houston Creek or Lake Gregory (Less than Significant with Mitigation).

Proposed Project construction would involve the use of heavy equipment to remove trees and shrubs; remove, haul and stockpile material from the downstream face of the dam; excavate borrow sites (as needed); improve access roads; temporarily realign Lake Drive; relocate utilities (if required); construct the downstream stabilizing buttress; and reclaim the buttress and borrow sites. Material for construction would be imported from existing stockpiles and new borrow sites (if needed), and possibly obtained from commercial quarries. Buttress material would be processed at the construction site. Construction-related materials, including sediment, diesel fuel, gasoline, lubrication oil, hydraulic fluids, anti-freeze, transmission fluid, lubricating grease, trash and other items could, if introduced to Houston Creek or Lake Gregory, could adversely affect beneficial uses, which would be a significant, temporary impact.

Under existing regulations, the Project, which would involve 4 to 5 acres of disturbance, would be subject to the California General Permit for Discharges of Storm Water Associated with Construction Activity. The
General Permit requires a sediment risk assessment and a receiving waters assessment. A SWPPP, prepared by a qualified SWPPP developer, would be required for development and would include implementation of BMPs to identify and control sediment and other pollutants from entering surface waters.

The proposed Project would also require 401 Certification by the Lahontan Regional Water Quality Control Board. Standard requirements for 401 Certification include requirements that the construction not violate the Water Quality Control Plan for the Lahontan Region. The Lahontan Regional Water Quality Control Board may add additional Project-specific requirements to protect water quality. Additional water quality protection may come from compliance with Sections 1600–1616 of the California Fish and Game Code, and Section 404 of the Clean Water Act.

Mitigation Measure HW-1 would require the County to develop a stormwater control plan to manage stormwater and to prevent construction-related pollutants from reaching State waters. Together with Mitigation Measures BIO-1, BIO-2, BIO-3, BIO-4, AQ-1, HAZ-1, and HAZ-3, and compliance with the State and Federal clean water regulations described in Section 3.8.2, Mitigation Measure HWQ-1 would reduce impacts to water quality to less than significant.

**Mitigation Measures**

**MM HW-1 Develop a Stormwater and Erosion Control Plan.** The County will develop a stormwater and erosion-control plan in compliance with and conformance to the objectives and water quality standards in the Basin Plan to ensure no construction-related, or post-construction Project-related adverse impact to the quality of State waters. The stormwater and erosion-control plan will take into account seasonal variations in hydrologic conditions and include appropriate, site-specific pollution-control BMPs such as, but not limited to:

1. Identification and, if possible, avoidance of underground utilities in construction;
2. Use of turbidity curtains to prevent sediment migration to State waters;
3. Halting of construction during periods of inclement weather or high winds;
4. Water quality monitoring during construction, and monitoring of construction vehicles and equipment for leaks, with implementation of corrective actions where a threat to water quality is found;
5. Control of debris, cement, concrete, oil, and petroleum products such that these are prevented from washing into surface waters;
6. Lining of temporary diversion channels with filter fabric or plastic to prevent erosion and sediment transport;
7. On-site emergency spill control equipment under the responsibility of trained construction personnel; and
8. Recontouring and revegetation of areas of temporary impact.

The stormwater and erosion-control plan will specifically address potential erosion-related impacts to water quality from diversions or reservoir draw-down as follows:

1. The discharge point for temporary dewatering of the reservoir for construction will be protected from erosion by the installation of a temporary riprap or similar...
structure designed to dissipate water energy and prevent localized erosion of the channel bed and banks.

2. Any diversion of Houston Creek flows for the purpose of construction will be protected from erosion by enclosure in a pipe, with outlet protected against erosion as described above, or otherwise protected against erosion by temporary non-erodible channel liner.

**Impact HW-2:** The proposed Project could alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site (Less than Significant with Mitigation)

Proposed Project construction has the potential to divert Houston Creek at the location of the dam. The reservoir level may need to be adjusted seasonally due to inflows, or for other reasons during construction, with the drained water discharged into Houston Creek downstream of the dam. Any diversion or concentrated discharge of reservoir water has the potential for creating local erosion of the Houston Creek channel banks, and siltation in Houston Creek downstream of the dam. Stockpiled materials could block or divert local drainage or otherwise result in siltation through direct erosion of the stockpile.

Construction would be primarily on the face of the dam, and would not alter the course of Houston Creek. The two materials stockpiles are existing. Neither the stockpiles nor the borrow sites are in positions that would substantially alter drainage patterns. The temporary roadway relocation would be adjacent to the existing road and would not alter drainage patterns. Off-site siltation could occur due to ground disturbance during construction, and would be addressed under existing regulations as described above for Impact HW-1. The proposed Project is therefore not expected to induce substantial erosion or siltation. Impact HW-2 is less than significant with implementation of Mitigation Measures HW-1 and BIO-1.

Seepage of water through the liquefaction zone to the area downstream of the dam would continue after construction, but under the control of a layered drainage system. No effect on seepage-related flows in Houston Creek is expected.

**Impact HW-3:** The proposed Project would create a flood hazard (Beneficial Impact)

Flood hazards could be created by substantially altering the existing drainage pattern, substantially increasing the rate or amount of surface runoff, creating or contributing runoff water which would exceed the capacity of existing or planned stormwater drainage systems, impeding or redirecting flood flows, exposing people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam, or resulting in inundation by seiche, tsunami, or mudflow.

The proposed Project is limited to the face of Lake Gregory Dam and would not alter the drainage pattern. No new impervious areas would be created, resulting in negligible increase in runoff potential. Borrow areas, stockpiles, and staging areas may temporarily impede or redirect local runoff, but such disturbances would be very local and not within established drainageways. Lake Gregory, and any potential for seiche that may occur there, would be unaffected. Any mudflow that could potentially be induced by the proposed Project would be in Houston Creek where the risk of loss, injury, or death is low.

Inundation by failure of Lake Gregory Dam is possible in the existing condition and could result in substantial damage to Houston Creek habitat, and a substantial risk of life and property, mainly along the Mojave River downstream of the confluence with Houston Creek. A stability evaluation (TetraTech, 2012
[Appendix 5d]) found that the dam does not meet DWR requirements for stability under earthquake and post-earthquake conditions as well as requirements for earthquake-caused deformation. Proposed Project construction, by disturbing the existing dam face, could temporarily increase the potential for dam failure. However, dam failure is expected to occur as a result of an earthquake, which is unlikely during the short construction period, and all design and construction operations would be under the supervision of the DWR Division of Safety of Dams as required by Division 3 of the California Water Code to minimize the potential for construction-induced failure. The proposed Project would improve the long-term stability of the dam and ultimately reduce the potential for dam failure. As a result of the reduced risk of flooding from dam failure, the Project effect related to Impact HW-3 is considered beneficial. No mitigation is necessary.

**Impact HW-4: Construction would deplete local groundwater supplies (Less than Significant)**

Construction of the downstream buttress would require removal of the existing protective rock facing followed by excavation and removal of loose foundation materials and soil down to firm bedrock (TetraTech, 2012 [Appendix 5d]). The buttress foundation excavation would likely encounter groundwater along bedrock joints and seepage from the dam. Significant impacts would occur if the proposed Project dewatering interfered with downstream recharge to the fractured bedrock aquifer and lowered the local groundwater level.

Dewatering during construction of the proposed Project would temporarily interrupt groundwater flow at the downstream toe of the dam before discharging to Houston Creek, the normal flowpath for the spring and dam seepage. These dewatered fluids, properly treated to remove sediment and suspended solids (and possibly motor vehicle fluids as identified in Impact HW-1), would be returned to Houston Creek downstream of the work area. This type of discharge must comply with an NPDES General Permit as required by the Lahontan RWQCB, including a Best Management Practices (BMPs) Plan (LRWQCB, 2008). Alternatively, dewatered fluid could be temporarily stored and used for dust control and soil compaction, thereby reducing the amount of municipal supply water used for the proposed Project. Dewatering would cease after the buttress fill rises above the local piezometric surface (the elevation of the water surface in the reservoir) resulting in no significant impact to the local groundwater resource.

Dewatered fluid used for proposed Project uses (dust suppression, soil compaction) would replace water that would otherwise need to be provided by CVWD. Either approach to discharge dewatered fluid to the creek or partly replace local municipal supplies, would not deplete the local groundwater resource, interfere with groundwater recharge or lower the local groundwater table. The local groundwater regime at the dam would not be adversely impacted by the temporary dewatering that may be required during excavation of the buttress foundation area. Impact HW-4 is less than significant. No mitigation is necessary.

### 3.8.4 Level of Significance after Mitigation

Hydrology and water quality impacts would be less than significant with mitigation. In addition, the Project would have a beneficial impact with regard to hazards from floods.
3.9 Land Use

This section of the EIR describes the jurisdictional plans, policies, and regulations that apply to the Project, and the existing land use conditions in the Project area. The Project would occur within County and private lands, which are under the County’s jurisdiction. The environmental setting also describes current land uses and land ownership and designations, and the regulatory setting lists the applicable land use regulations.

3.9.1 Environmental Setting

Lake Gregory is in the San Bernardino Mountains in the community of Crestline, approximately 14 miles north of the City of San Bernardino. The Project area is accessible via Lake Drive from Highway 138 to Crestline. The San Bernardino National Forest surrounds Crestline, but the Project site, including the stockpile and borrow site areas at Thousand Pines Christian Camp, are on County and private lands. The majority of the local area has been developed with residential, commercial, and recreational land uses, and the surrounding landscape is mostly natural open space. None of the Project components would be located on National Forest Service lands.

The area immediately surrounding the dam consists primarily of open space, residential development, and the various Lake Gregory recreational facilities. Development adjacent to the dam includes a San Bernardino County fire station (not currently in use) and the Crestline Sanitation District facility. Camp Switzerland, a private seasonal campground with cabins, tent-camping, and RV hook-ups, is located about 500 feet downstream of the dam. However, Camp Switzerland is currently closed and has been closed since 2014. Lake Drive traverses the crest of the dam and is the main thoroughfare for traffic around the lake.

Sensitive land uses in the vicinity of the Project activities include four residences along Edelweiss Drive, within 100 feet of the driveway leading to Camp Switzerland. Within 500 feet northeast of the Project site, there are numerous single-family homes along Delle Drive and Darfo Drive on a hill overlooking Camp Switzerland. Southwest of the site along Zermatt Drive, there are numerous single-family homes approximately 500 feet from the Project site. The closest school is Mountain High School, which is located on San Moritz Way across Lake Gregory, approximately 1,800 feet east of the construction activities. The proposed detour route to be used when Lake Drive is closed at the crest of the dam includes San Moritz Way, and detour traffic would pass by the school.

The earthen materials stockpile location at Thousand Pines Christian Camp is approximately 2 miles from the dam (Figure 2-2). The County of San Bernardino holds a Temporary Use Permit for the stockpile yard. There is currently an estimated 6,000 cubic yards of sediment on site that was removed from the first phase of the Lake Gregory Swim Beach Silt Management Project. Additional material from the second phase of the sediment removal project has been stockpiled here. In addition, sediment removed from Lake Arrowhead from a previous dredging project will also be hauled from the stockpile at Papoose Dam for use in the proposed Project. The stockpile area at Thousand Pines Christian Camp is accessed via paved Pine Ridge Road and is surrounded by montane coniferous forests similar to those near the dam. There is also some scrub vegetation in the immediate vicinity. East of the stockpile site there is a remnant apple orchard and a small riparian corridor with some meadow species also present. The area has been impacted by recent and historical human land uses.

The proposed Ponderosa West and Ponderosa East borrow sites are up to 1.5 acres each, located on property owned by the Thousand Pines Christian Camp. The Ponderosa East Borrow Site location is...
Lake Gregory Dam Rehabilitation Project

3. ENVIRONMENTAL SETTING, ANALYSIS, AND MITIGATION MEASURES

approximately one mile west of Lake Gregory Dam, and the Ponderosa West Borrow Site location is approximately 600 feet west of the Ponderosa East Borrow Site. Both proposed borrow sites consist of montane coniferous forest similar to that near the dam. They are within a portion of the camp property that is not routinely used for camp activities, and the sites are relatively undisturbed.

Table 3.9-1 identifies the existing land uses and land use zoning for the Project area.

<table>
<thead>
<tr>
<th>Existing Land Uses</th>
<th>Land Use Zoning District 1</th>
<th>Description/ Purpose of District 2</th>
<th>Project Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Gregory Trail, dam crest, Lake Drive</td>
<td>Open Space (OS)</td>
<td>Maintains open space on property legally constrained by deed restrictions on the property.</td>
<td>Temporary relocation of Lake Drive and underground utilities</td>
</tr>
<tr>
<td>Camp Switzerland 3</td>
<td>Multiple Residential (RM)</td>
<td>Provides areas for attached, detached, and/or mixed residential development with a wide range of densities and housing types; locate parcels appropriate for development at higher residential densities in closer proximity to community services and facilities; allows for diverse non-residential activities compatible with a multifamily neighborhood</td>
<td>Removal of trees, vegetation, and existing rock from the downstream slope of Lake Gregory Dam; removal of foundation material at the base of the dam; construction of a new 40-foot average thickness earthen buttress extending beyond the current toe of the embankment; placement of new slope protection on the buttress</td>
</tr>
<tr>
<td>Rural Living (RL)</td>
<td>Provides sites for rural residential uses, incidental agricultural uses, and similar and compatible uses</td>
<td>Houston Bridge reinforcements</td>
<td></td>
</tr>
<tr>
<td>Lake Gregory Floodway (FW)</td>
<td>Provides sites for animal keeping, grazing, crop production, and similar and compatible uses; and identifies and preserves areas for flood flow.</td>
<td>Adjacent use, no Project activities would occur within the lake</td>
<td></td>
</tr>
<tr>
<td>Crestline Sanitation District, Closed County Fire Station Service Commercial (CS)</td>
<td>Provides suitable areas for a mixture of commercial and industrial uses, including manufacturing uses, where they will not adversely affect surrounding properties; and provides suitable locations for retail, wholesale, intensive commercial, and service establishments.</td>
<td>Adjacent use, no Project activities would occur except possible staging on CSD property</td>
<td></td>
</tr>
<tr>
<td>Thousand Pines Christian Camp, rural residences, County forest land Single Residential (RS)</td>
<td>Provides areas for single-family homes on individual lots, areas for accessory and non-residential uses that complement single residential neighborhoods, and discourages incompatible non-residential uses in single-family residential neighborhoods.</td>
<td>Retrieval of stockpiled earthen material from the Thousand Pines Christian Camp</td>
<td></td>
</tr>
<tr>
<td>Ponderosa West and Ponderosa East Borrow Sites RL</td>
<td>Provides sites for rural residential uses, incidental agricultural uses, and similar and compatible uses</td>
<td>Excavate a total of approximately 20,000 to 35,000 cubic yards of soil from both borrow sites over a 4-month period</td>
<td></td>
</tr>
</tbody>
</table>

1 – SBC, 2010
2 – SBC, 2014a
3 – Camp Switzerland is typically open for public camping in the spring (April or May) through early fall. However, the Camp is currently closed and has not been operational since 2014. The County and Camp Switzerland have negotiated Project-related shutdowns and settlements for 2014 and 2015. Some shutdowns may also be needed in 2016 and 2017 due to Project-related construction activities.
3.9.2 Applicable Regulations, Plans, and Standards

County of San Bernardino General Plan – Land Use Element

The County’s General Plan is divided by three regions. The majority of the County is within the Desert Region, and the southern portions of the County are within the Mountain Region and Valley Region. The proposed Project is entirely within the Mountain Region; however, there are no goals or policies for the Mountain Region that apply to the proposed Project.

As stated in the General Plan, the County utilizes a “one-map” system, in which the County’s General Plan Land Use Map also serves as the County’s official Zoning Map. Based on GIS data obtained from the County, Table 3.9-1 provides the County Land Use Zoning Districts, along with the descriptions of the District, that would be traversed by the proposed Project.

The County of San Bernardino General Plan consists of eight elements which form a comprehensive set of planning policies. The Land Use Element designates the general distribution and intensity of land uses within the unincorporated area of the County. This Element also functions as a guide to planners, the general public, and decision makers as to the ultimate pattern of development for the County of San Bernardino. (SBC, 2014a)

Applicable land use policies set forth by the County’s Land Use Element, are as follows:

GOAL LU 8. Beneficial facilities, such as schools, parks, medical facilities, sheriff and fire stations, libraries, and other public uses, as well as potentially hazardous sites, will be equitably distributed throughout the County.

Policy LU 8.2 Review development proposals to minimize impacts, such as air emissions, on sensitive receptors.

GOAL LU 11. Promote mutually beneficial uses of land to address regional problems through coordination and cooperation among the County, the incorporated cities, Southern California Association of Governments (SCAG), San Bernardino Associated Governments (SANBAG), the various special districts and other local, state, and federal agencies.

Policy LU 11.3 Work with the Bureau of Land Management (BLM), U.S. Forest Service, the U.S. Park Service, and other public agencies to eliminate conflicts between public and private lands, and to designate and protect wilderness and restricted natural areas.

Crest Forest Community Plan

The entire Project site, including the borrow sites, are within the County’s Crest Forest Community Plan area. The primary purpose of this Community Plan is to guide the future use and development of land within the plan area to preserve the character and independence of the community by setting goals and policies for that are distinct from those applied countywide. The Land Use goals and policies within this plan primarily focus on residential, commercial, and industrial development; and the Infrastructure goals and policies focus on water use and conservation (SBC, 2007). Therefore, none of the goals and policies related to land use apply to the proposed Project.
Development Code

The County Development Code is not applicable to the proposed Project as the State Division of Safety of Dams (DSOD) is the agency that issues permits for the dam, as exempted by Development Code §82.02.040(a) (SBC, 2014b).

82.02.040 Exemptions from Planning Permit Requirements

(a) General requirements for exemption. The land uses, structures, and activities identified by Subsection (b) below are exempt from the planning permit requirements of this Development Code only when:

(2) Any permit or approval required by regulations other than this Development Code is obtained.

3.9.3 Environmental Impacts and Mitigation Measures

This section analyzes the land use impacts associated with implementation of the proposed Project. The impact analysis describes the methods used to determine the proposed Project’s impacts and lists the thresholds used to conclude the significance of an impact.

Impact Assessment Methodology

The methodology for analyzing land use impacts includes identifying the existing land uses that may be disrupted during proposed Project construction, operation, and maintenance activities. In addition, federal, State, and local agency local laws, ordinances, regulations, and standards were analyzed to determine the proposed Project’s compliance with the applicable policies and regulations.

Thresholds of Significance

The significance of potential land use impacts were determined based on relevant State CEQA Guidelines, Appendix G. Using these thresholds, the proposed Project would be considered to have significant land use impacts if it were to:

- **LU-1**: Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project (including but not limited to the general plan, specific plan, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect.

The following thresholds from the CEQA Appendix G Environmental Checklist are not relevant to the proposed Project and are not discussed further beyond the summary below:

- **X (a) Physically divide an established community.**

  The physical division of an established community is typically associated with large-scale linear projects such as transportation/transit uses (i.e., freeways, railroads, and light rail), that would have the potential to bisect a community, which could lead to additional land use incompatibilities and socioeconomic effects. This type of impact would not occur as a result of the site-specific activities associated with the proposed Project. Therefore, there would be no impact related to CEQA Threshold X (a).

- **X (c) Conflict with any applicable habitat conservation plan or natural community conservation plan.**
The Project site is not located within any adopted Habitat Conservation Plan (HCP), Natural Communities Conservation Plan (NCCP), or other approved local, regional, or state HCP area. The Project would not conflict with such plan and no impact would occur related to CEQA Threshold X (c).

**Project Impacts**

**Impact LU-1:** The Project could conflict with an applicable land use plan, policy, or regulation of an agency with jurisdiction over the Project, adopted for the purpose of avoiding or mitigating an environmental effect (Less than Significant)

**Land Use Element.** Section 3.9.2, above, lists the two policies that apply to the proposed Project. The following discussion provides the Project's consistency with these policies.

As presently built, the Lake Gregory Dam does not meet the DSOD's seismic safety requirements, so the intent of the proposed Project is to stabilize the Lake Gregory Dam to reduce downstream hazards associated with dam failure in the event of a major earthquake. For this Project, the County and DSOD are collaborating to fulfill the objective of rectifying structural inadequacies in accordance with DSOD safety standards, thereby protecting public and private lands. Therefore, the proposed Project would not conflict with Policy LU 11.3. In addition, the purpose of this EIR is to review the potential environmental impacts associated with the proposed Project and develop mitigation measures that will minimize environmental impacts. Therefore, the proposed Project would not conflict with Policy LU 8.2.

**Development Code.** The proposed Project is an existing land use within the County’s Open Space (OS), Multiple Residential (RM) and Rural Living (RL) Land Use Zoning Districts. Ordinarily, construction for a Utility Facility within the residential districts would require a conditional use permit under the County’s Development Code, and within the OS District, a Utility facility would not be allowed. However, according to the County, the DSOD issues the permits for dams, so the County’s Development Code is not applicable to this Project. Therefore, the proposed Project does not require a conditional use permit.

The County holds a Temporary Use Permit for the stockpile yard within the Thousand Pines Camp. As stated in §85.15.010, compliance with applicable standards for a Temporary Use Permit ensures that the establishment, maintenance, and operation of the short-term activity would not be detrimental to the public health, safety, and welfare of persons residing or working in the neighborhood of the proposed activity (SBC, 2014b). Considering that the existing Temporary Use Permit allows for the same general activity, the retrieval of stockpiled material at the Thousand Pines Camp would be considered a compatible use. According to 85.15.080(f)4, the permit may be approved for up to 12 months following the issuance of the companion Building Permit, or upon completion of the subject development project, whichever first occurs (SBC, 2014b).

The proposed Project would not conflict with any applicable land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Impacts would be less than significant, and no mitigation is required.

**3.9.4 Level of Significance After Mitigation**

Impacts related to conflict with existing land use plans and regulations would be less than significant, and no mitigation is required.
3.10 Noise

This section describes the potential noise impacts from the proposed Project. This section also provides the environmental and regulatory settings and discusses mitigation measures to reduce impacts where applicable.

3.10.1 Environmental Setting

The assessment of noise impacts uses specific terminology and descriptors not commonly used in everyday conversation. Therefore, to assist in a thorough understanding of the subsequent analysis, Table 3.10-1 provides definitions for technical terminology utilized.

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>A-Weighted Sound Level (dBA)</td>
<td>A unit describing the amplitude of sound using the A-weighted filter network. The A-weighted filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.</td>
</tr>
<tr>
<td>Ambient Noise Level</td>
<td>The composite noise from all sources resulting in the normal, existing level of environmental noise at a given location. The Leq, as defined below, typically defines the ambient level.</td>
</tr>
<tr>
<td>Equivalent Noise Level (Leq)</td>
<td>The average A-weighted dB level, on an equal energy basis, during any continuous sound measurement period.</td>
</tr>
<tr>
<td>Maximum Noise Level (Lmax)</td>
<td>The maximum noise level during any continuous sound measurement period.</td>
</tr>
<tr>
<td>Minimum Noise Level (Lmin)</td>
<td>The minimum noise level during any continuous sound measurement period.</td>
</tr>
</tbody>
</table>

General Information on Noise

The effects of noise on people can be grouped into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction;
- Interference with activities such as speech, sleep, learning; and
- Physiological effects such as startling and hearing loss.

In most cases, typical noise produces effects in the first two categories, being subjective effects and interference with activities only. An example of physiological effects of noise may include workers in industrial plants that might experience physiological effects of noise. No satisfactory way exists to measure the subjective effects of noise, or to measure the corresponding reactions of annoyance and dissatisfaction. This lack of a common standard is due primarily to the wide variation in individual thresholds of annoyance and habituation to noise. Thus, an important way of determining a person’s subjective reaction to a new noise is by comparison with the existing or “ambient” environment to which that person has adapted.

Community noise levels are usually closely related to the intensity of nearby human activity. Noise levels are generally considered low when ambient levels are below 50 dBA, moderate in the 50 to 65 dBA range, and high above 70 dBA (FTA, 2006).
Typical daytime Leq noise levels are:
- 35 dBA or below in rural and wilderness lands,
- 50 to 60 dBA in sparse residential areas,
- 75 dBA in busy urbanized areas, and
- 85 dBA near major freeways and airports.

Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, high noise levels are nevertheless considered to be adverse to public health. In general, the more the level or the tonal (frequency) variations of a noise exceed the existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual. When comparing sound levels from similar sources (for example, changes in traffic noise levels), a 3 dBA increase is considered to be a just-perceivable difference, while a 5 dBA difference is clearly perceivable, and 10 dBA is considered a doubling in perceived loudness.

**General Information on Vibration**

Vibration is a phenomenon related to noise, where common sources include trains, large vehicles on rough roads, and construction activities such as blasting, pile-driving, and operating heavy earth-moving equipment (FTA, 2006). Vibration generally results in an oscillatory motion in terms of the displacement, velocity, or acceleration of the ground or structure(s) that causes a normal person to be aware of the vibration by means such as, but not limited to, sensation by touch or visual observation of moving objects. Several land uses are sensitive to vibrations, including residential areas.

**Noise-Sensitive Receptors**

An example of noise-sensitive receptors would be schools, hospitals, residences, and recreational facilities. Sensitive receptors in the vicinity of the proposed Project are primarily residential. Project work areas and haul routes are shown in Figure 2-2. The nearest sensitive receptors to the dam are hillside residences located approximately 0.3 mile east and southeast (across Lake Gregory). Additionally, recreational areas exist along the lake shoreline immediately adjacent to Lake Drive. The borrow sites are located within the Thousand Pines Christian Camp, which is considered a private recreational receptor. The nearest residence to either borrow site or the stockpile area is approximately 1,000 feet away (located off South Thousand Pines Road). Residences are also located immediately adjacent to the haul routes shown in Figure 2-2.

**Existing Ambient Noise Levels**

Existing ambient noise levels at sensitive receptor locations in the vicinity of the dam and truck routes were observed and recorded on August 14, 2014, to document existing daytime ambient noise conditions. Ambient noise levels were recorded at several locations for 15 minutes throughout the day. The primary source of noise near the dam and along the proposed haul routes is from vehicles. The results of average ambient noise observations and measurements are as follows:
- 60-65 dBA Leq along Lake Drive near the dam.
- 50-55 dBA Leq at residential areas east/southeast of the dam and along the material truck route north of Lake Drive

Maximum (Lmax) noise levels of approximately 85 dBA were recorded from trucks and larger passenger vehicle trips along the stockpile haul route roadways shown in Figure 2-2. These maximum noise levels
were frequently observed along Lake Drive and also from uphill vehicle accelerations in hillside residential areas. The \( L_{\text{min}} \) levels measured during short-term monitoring periods averaged 45 dBA in residential areas and 50 dBA along Lake Drive near the dam site.

While measurements were not conducted along borrow site truck route roadways that contain residential receptors (refer to Figure 2-2), ambient conditions along this route are expected to be similar to those presented above along the stockpile route, and the haul route from the stockpiles is the same route as from the stockpile between Zurich Drive and the dam. In summary, daytime noise levels at receptors near the dam along the truck routes can be expected to range from 50 to 65 dBA \( L_{\text{eq}} \). The lower end of this range represents periods with little or no vehicle pass-by near these rural residences and the higher end of this range represents a receptor experiencing more frequent vehicle pass-by. Daytime ambient noise levels near the borrow sites and stockpile area are expected to range from 40 to 50 dBA \( L_{\text{eq}} \).

3.10.2 Applicable Regulations, Plans, and Standards

The proposed Project site is located in the community of Crestline, within unincorporated San Bernardino County. Therefore, the applicable regulations, plans, and standards pertaining to noise control would be those of San Bernardino County.

San Bernardino County

The proposed Project would only generate noise during construction. Therefore, only County regulations pertaining to construction noise are applicable. The County of San Bernardino 2007 General Plan Noise Element (San Bernardino County, 2014 [Chapter VII]) defines noise-sensitive land uses as residences, schools, churches, and parks. The Noise Element does not include any applicable goals or policies related to construction noise compatibility.

The County of San Bernardino 2007 Development Code defines noise-sensitive land uses as residential uses, schools, hospitals, nursing homes, religious institutions, libraries, and similar uses (San Bernardino County, 2007 [Chapter 83.01 General Performance Standards]). Applicable sections of the San Bernardino County Development Code that regulate construction noise include:

- **Section 83.01.080(g) – Exempt Noise.** Noise from temporary construction, maintenance, repair or demolition activities is exempt between 7:00 a.m. and 7:00 p.m., except Sundays and federal holidays.

- **Section 83.01.090(c) – Exempt Vibrations.** Vibration from temporary construction, maintenance, repair or demolition activities is exempt between 7:00 a.m. and 7:00 p.m., except Sundays and federal holidays.

3.10.3 Environmental Impacts and Mitigation Measures

Thresholds of Significance

The significance of potential noise impacts were determined based on relevant State CEQA Guidelines, Appendix G. Using these thresholds, the proposed Project would be considered to have a significant impact related to noise if it were to result in:

- **NOI-1:** Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

- **NOI-2:** Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.
NOI-3: A substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project.

NOI-4: A substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project.

The following thresholds from the CEQA Appendix G Environmental Checklist are not relevant to the proposed Project and are not discussed further beyond the summary below:

XII (e) For a project located within and airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, expose people residing or working in the project area to excessive noise levels, and

XII (f) For a project within the vicinity of a private airstrip, expose people residing or working in the project area to excessive noise levels

The Project site is not located near any public airport or private airstrips. The proposed Project does not include permanent residential housing nor would it subject construction workers to aviation-related noise. No impact would occur related to CEQA Thresholds XII (e) and XII (f).

Project Impacts

Impact NOI-1: The Project could expose persons to or generate noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (Less than Significant)

Construction Noise Analysis

Construction of the proposed Project would occur between 7:00 a.m. and 3:30 p.m., Monday through Friday, for up to 12 months (including down time for inclement weather). Construction noise would occur during the exempt hours of 7:00 a.m. and 7:00 p.m., per Section 83.01.080(g) of the County Development Code. Therefore, construction noise would be consistent with the San Bernardino County Development Code. Although construction would generate noise, it would be temporary and during limited hours, and thus, impacts would be less than significant.

Operational Noise Analysis

Operation and maintenance activities would be limited to vegetation control, debris and trash removal, minor erosion repairs, and routine inspections. Because noise generated by these activities would be periodic and temporary, they would not increase overall ambient noise conditions proximate to the dam. Due to the temporary nature of proposed Project maintenance noise, it is consistent with the construction noise exemption of the County Development Code Section 83.01.080(g). The proposed Project would not generate any new permanent operational noise and would not be subject to any operational noise performance standards or policies contained within the San Bernardino County General Plan Noise Element and San Bernardino County Development Code Chapter 83.01. Therefore, operational noise would be consistent with all applicable plans and impacts would be less than significant.

Impact NOI-2: The Project could expose persons to or generate excessive groundborne vibration or groundborne noise levels (Less than Significant)

Groundborne vibrations generated by man-made activities attenuate rapidly with distance from the source of the vibration. Ground vibrations from construction activities do not often reach the levels that can damage structures, but can achieve the audible and feelable ranges in buildings very close to the source (FTA, 2006). While on-site construction equipment use (primarily buttress compacters), earthen
material loading/unloading activities, and heavy truck trips may produce short-term groundborne vibration, such vibration would only be of concern at any existing sensitive receptor structures located within close proximity of the source. As discussed earlier, no sensitive receptors are located adjacent to the dam site.

Residences located adjacent to the proposed truck routes may be subject to temporary and periodic short-term vibration from trucks hauling material to the dam site from the material stockpile/borrow sites. The main cause of vibration during vehicle transport is travel over uneven road surfaces. Construction is expected to require approximately 150 daily truck trips. Haul trucks would utilize slightly different truck routes throughout construction, depending upon where the material is being transported from on that day.

Vibration from construction is exempt from any performance standard if occurring between the hours of 7:00 a.m. and 7:00 p.m., per Section 83.01.090(c) of the County Development Code, which is intended to regulate construction vibration to County residences. Construction of the proposed Project would occur between 7:00 a.m. and 3:30 p.m., Monday through Friday; therefore, all construction activities would occur within this exempt period. Furthermore, while exempt from any standard, any temporary and periodic vibration from haul truck trips adjacent to residences is expected to be at similar levels to that generated by large truck trips occurring under existing conditions along local roadways.

Once operational, maintenance activities would occur only at the dam site and would generate negligible perceivable vibration. Because the nearest adjacent receptors to the dam site are greater than 500 feet away, no receptors would be subject to vibration during maintenance. Therefore, construction and operation of the proposed Project would have less-than-significant groundborne vibration impacts.

**Impact NOI-3:** *The Project could result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project (Less than Significant)*

As discussed under Impact NOI-1, operation of the proposed Project would not result in a substantial permanent increase in ambient Leq noise levels. Periodic and temporary maintenance noise would primarily be limited to the dam site only and would not permanently increase ambient noise conditions either at the site or at any adjacent receptors. Operational noise impacts would be less than significant.

**Impact NOI-4:** *The Project could result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project (Less than Significant with Mitigation)*

As discussed in Impact NOI-1, construction noise is exempt from any performance standard by the County Development Code. However, the following analysis addresses temporary noise levels expected during construction. Typical noise levels from heavy equipment likely used during construction are presented in Table 3.10-2.

<table>
<thead>
<tr>
<th>Table 3.10-2. Typical Noise Levels for Construction Equipment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Equipment</strong></td>
</tr>
<tr>
<td>Paver</td>
</tr>
<tr>
<td>Crane</td>
</tr>
<tr>
<td>Chainsaw</td>
</tr>
<tr>
<td>Bulldozer</td>
</tr>
<tr>
<td>Grader</td>
</tr>
<tr>
<td>Excavator</td>
</tr>
<tr>
<td>Water Truck</td>
</tr>
<tr>
<td>Loaded Dump Truck</td>
</tr>
</tbody>
</table>

Impact NOI-3: The Project could result in a substantial permanent increase in ambient noise levels in the Project vicinity above levels existing without the Project (Less than Significant)

As discussed under Impact NOI-1, operation of the proposed Project would not result in a substantial permanent increase in ambient Leq noise levels. Periodic and temporary maintenance noise would primarily be limited to the dam site only and would not permanently increase ambient noise conditions either at the site or at any adjacent receptors. Operational noise impacts would be less than significant.

Impact NOI-4: The Project could result in a substantial temporary or periodic increase in ambient noise levels in the Project vicinity above levels existing without the Project (Less than Significant with Mitigation)

As discussed in Impact NOI-1, construction noise is exempt from any performance standard by the County Development Code. However, the following analysis addresses temporary noise levels expected during construction. Typical noise levels from heavy equipment likely used during construction are presented in Table 3.10-2.
Table 3.10-2. Typical Noise Levels for Construction Equipment

<table>
<thead>
<tr>
<th>Equipment</th>
<th>Lmax dBA at 50-Feet</th>
</tr>
</thead>
<tbody>
<tr>
<td>Backhoe</td>
<td>80</td>
</tr>
<tr>
<td>Ground Compactor</td>
<td>80</td>
</tr>
<tr>
<td>Air Compressor</td>
<td>80</td>
</tr>
<tr>
<td>Backhoes</td>
<td>78</td>
</tr>
</tbody>
</table>

Source: FHWA, 2006

Line sources of noise, such as roadway traffic, attenuate (lessen) at a rate of 3.0 dBA to 4.5 dBA per doubling of distance from the source. Point sources of noise, including idling vehicles and on-site stationary equipment, attenuate at a rate of 6.0 dBA to 7.5 dBA per doubling of distance from the source (FHWA, 2006).

On-site Stationary Noise. The nearest adjacent residential property from the dam site is approximately 600 feet east. Based on attenuation, on-site point source construction noise would attenuate approximately 15 to 20 dB at this location. It is likely construction noise would attenuate more given the dam site is located within a depression and surrounded by steep wooded terrain. When the equipment noise levels presented in Table 3.10-2 are reduced to this attenuated level, the remaining noise is expected to be equal or negligibly greater than observed ambient noise conditions at this location.

Noise from equipment use at the borrow sites would occur within the Thousand Pines Christian Camp. However, given the agreement between the Camp and the County for use of these borrow sites, it is assumed any noise-sensitive activities would be temporarily suspended by the Camp proximate to the borrow site areas during Project construction. The nearest residence to any borrow site or the stockpile area is approximately 1,100 feet away (located off South Thousand Pines Road). At this distance, any construction noise would attenuate to below ambient levels. Additionally, on-site construction equipment would not be in constant use. Therefore, periodic and temporary noise generated by construction activities at the dam, borrow sites, and stockpile area is expected to have a negligible impact to the overall ambient noise levels at adjacent receptors.

Mobile Noise. Construction would result in noise from heavy truck trips traveling to and from the dam and material stockpile/borrow sites, as shown in Figure 2-2. Construction is expected to require an average of 150 daily truck trips. Haul trucks would utilize slightly different truck routes throughout construction, depending upon where the material is being transported from on that day. As presented in Table 3.10-2, loaded haul trucks would produce periodic bursts of noise of approximately 81 dBA at residential receptors along the routes during working hours. However, this noise level is not greater than that already produced by vehicles utilizing these roads under existing conditions. The Project would only temporarily increase the frequency of truck trips on these roadways per day.

As discussed under Impact NOI-1, all construction noise generated by the proposed Project is exempt per Section 83.01.080(g) of the County Development Code. However, Mitigation Measure NOI-1 is recommended to ensure any public complaints from temporary and periodic construction noise are immediately investigated and addressed by the County. With the inclusion of this measure, the proposed Project would result in less-than-significant temporary noise impacts.

Mitigation Measure

**MM NOI-1:** Implement Best Management Practices During Construction. During construction, the County and its contractor shall implement Best Management Practices (BMPs) for reducing construction noise. These measures should include, but not be limited to:
All noise-producing construction equipment and vehicles using internal combustion engines shall be equipped with mufflers, air-inlet silencers where appropriate, and any other shrouds, shields, or other noise-reducing features in good operating condition and appropriate for the equipment that meet or exceed original factory specifications. Mobile or fixed “package” equipment (e.g., arc-welder, air compressors) shall be equipped with shrouds and noise control features that are readily available for that type of equipment.

- Limit unnecessary idling of construction equipment.
- Electric-powered equipment shall be used instead of pneumatic or internal combustion power equipment, where feasible.
- The use of noise-producing signals, including horns, whistles, alarms, and bells, shall be limited to safety warning purposes only.
- No Project-related communication or music systems shall be audible at any adjacent receptor.

### 3.10.4 Level of Significance After Mitigation

Compliance with applicable regulations and standards would generally result in less-than-significant noise and vibration impacts. Impacts from noise during construction would be reduced to less than significant with implementation of mitigation.
3.11 Utilities

This section addresses the proposed Project’s potential impacts on certain utilities and services—water, electricity, natural gas, solid waste and wastewater, and stormwater. This section also provides the environmental and regulatory settings and discusses mitigation measures to reduce impacts where applicable.

3.11.1 Environmental Setting

Lake Gregory is located in the San Bernardino Mountains in the community of Crestline, approximately 14 miles north of the City of San Bernardino. The Project area is accessible via Lake Drive from Highway 138 to Crestline. The San Bernardino National Forest surrounds Crestline, but the Project site, including the borrow sites and stockpile area at Thousand Pines Christian Camp, are on County and private lands. The majority of the local area has been developed as residential and recreational land uses, and the surrounding landscape is mostly natural open space. None of the Project components would be located on National Forest lands.

The segment of Lake Drive that traverses the crest of Lake Gregory Dam would be temporarily widened to accommodate construction activities. Temporary asphalt paving would be installed on the south side of the existing Lake Drive alignment (see Figure 2-6, Option 2 - Temporary Lake Drive Traffic Lane). The additional temporary traffic lane would utilize the existing road shoulder above the beach and would not require excavation into the upstream face of the dam.

The following utilities occur along Lake Drive at the crest of the dam and would require temporary or permanent relocation:

- Crestline Sanitation District – sanitary sewer line
- Crestline Village Water District – 8-inch water line and two fire hydrant relocations
- Southern California Edison – overhead and underground electrical conduit and cable
- Verizon – Buried conduit and cable
- Southern California Gas Company – gas main pipeline

Electricity and Water

A temporary construction management trailer would be required to support construction of the proposed Project. The construction management trailer would have connection to power, water, and possibly telephone service. The construction contractor selected to construct the proposed Project would be responsible for providing generators and fuel as needed to power the equipment and vehicles required during construction. If nighttime construction is required, the construction contractor would also provide the necessary lighting.

During construction of the proposed Project, a water source would be required for soil compaction, dust suppression, concrete/grout/equipment wash-down (in designated areas per the Stormwater Pollution Prevention Plan [SWPPP]), concrete placement preparation, and possibly miscellaneous concrete or grout production. Based upon material to be compacted and dust control for the duration of the proposed Project, between 15 and 30 acre-feet of water may be used during construction. This water would be provided by the Crestline Village Water District. The availability of construction water would be verified prior to the issuance of a construction contract. Dewatering of shallow groundwater would be required.
during buttress construction and temporary realignment of Lake Drive. Water would be filtered and routed to Houston Creek.

**Solid Waste and Wastewater**

Material removed from the dam during preparation that cannot be reused for buttress construction, including excessively saturated and organic material, would be hauled out and disposed of at an approved landfill. Existing rock fill slope protection removed from the dam slope would be stockpiled and then reinstalled as slope protection on the buttress following construction.

Portable toilets would be provided on the construction site, and the construction management trailer would not require sewer service.

**Drainage**

Construction of the downstream stabilization buttress would occur over 4 to 6 months. Blanket and chimney drains would be installed in the liquefaction zone of the existing dam, and then the buttress would be constructed of earthen material against the downstream slope of the dam. The buttress would average 40 feet thick and extend beyond the current embankment toe. Stockpiled rock slope protection removed during site preparation would be replaced onto the buttress at the completion of construction.

Existing seepage from the dam is minimal, and would be diverted around the work area during construction via a small drainage ditch or channel. Areas of permanent disturbance would be covered with gravel, vegetation, or other stabilizing treatment, which would still allow for water absorption and would lessen stormwater runoff. As discussed in more detail in Section 3.8 (Hydrology and Water Quality), stormwater runoff has the potential to cause impacts on water quality, cause erosion, and result in loss of soils.

**3.11.2 Applicable Regulations, Plans, and Standards**

**State**

**California Department of Resources Recycling and Recovery (CalRecycle) Formerly California Integrated Waste Management Board (CIWMB).** CalRecycle is the State agency designated to oversee, manage, and track California’s 76 million tons of waste generated each year. It is one of the six agencies under the umbrella of the California Environmental Protection Agency. The CalRecycle develops laws and regulations to control and manage waste, for which enforcement authority is typically delegated to the local government. The board works jointly with local government to implement regulations and fund programs.

The Integrated Waste Management Act of 1989 (Public Resources Code (PRC) 40050 et seq. or Assembly Bill (AB 939, codified in PRC 40000), administered by the CalRecycle, requires all local and county governments to adopt a Source Reduction and Recycling Element to identify means of reducing the amount of solid waste sent to landfills. This law currently requires 75 percent recycling, composting, or source reduction of solid waste by 2020.

**Lahontan Regional Water Quality Control Board (RWQCB).** The primary responsibility for the protection of water quality in California rests with the State Water Resources Control Board (SWRCB) and nine RWQCBs. The State Board sets statewide policy for the implementation of State and federal laws and regulations. The RWQCBs adopt and implement Water Quality Control Plans (Basin Plans) which recognize regional differences in natural water quality, actual and potential beneficial uses, and water quality problems associated with human activities. The jurisdiction of the California RWQCB, Lahontan Region
(Regional Board) extends from the Oregon border to the northern Mojave Desert and includes all of California east of the Sierra Nevada crest.

**California Department of Toxic Substances Control State (DTSC).** The DTSC regulates hazardous waste, cleans up existing contamination, and looks for ways to reduce the hazardous waste produced in California. DTSC regulates companies and individuals that handle, transport, store, treat, dispose of, and clean-up hazardous wastes.

**California Department of Water Resources (DWR).** The California DWR is a department within the California Resources Agency. The DWR is responsible for the State’s management and regulation of water usage.

**Local**

*County of San Bernardino General Plan*

Circulation and Infrastructure Element (Water, Wastewater, and Stormwater)

**GOAL CI11.** The County will coordinate and cooperate with governmental agencies at all levels to ensure safe, reliable, and high quality water supply for all residents and ensure prevention of surface and ground water pollution.

**Policy CI11.1** Apply federal and state water quality standards for surface and groundwater and wastewater discharge requirements in the review of development proposals that relate to type, location and size of the proposed project to safeguard public health.

**Policy CI11.2** Support the safe management of hazardous materials to avoid the pollution of both surface and groundwaters. Prohibit hazardous waste disposal facilities within any area known to be or suspected of supplying principal recharge to a regional aquifer.

**GOAL CI13.** The County will minimize impacts to stormwater quality in a manner that contributes to improvement of water quality and enhances environmental quality.

**Policy CI13.1** Utilize site-design, source-control, and treatment control best management practices (BMPs) on applicable projects, to achieve compliance with the County Municipal Stormwater NPDES Permit.

**Policy CI13.2** Promote the implementation of low impact design principles to help control the quantity and improve the quality of urban runoff. These principles include:

- a. Minimize changes in hydrology and pollutant loading; ensure that post development runoff rates and velocities from a site do not adversely impact downstream erosion, and stream habitat; minimize the quantity of stormwater directed to impermeable surfaces; and maximize percolation of stormwater into the ground where appropriate.

- b. Limit disturbance of natural water bodies and drainage systems; conserve natural areas; protect slopes and channels;

- c. Preserve wetlands, riparian corridors, and buffer zones; establish reasonable limits on the clearing of vegetation from the project site;

- d. Establish development guidelines for areas particularly susceptible to erosion and sediment loss;

- e. Require incorporation of structural and non-stuctural BMPs to mitigate projected increases in pollutant loads and flows.
Circulation and Infrastructure Element (Solid Waste)

GOAL CI14. The County will ensure a safe, efficient, economical, and integrated solid waste management system that considers all wastes generated within the County, including agricultural, residential, commercial, and industrial wastes, while recognizing the relationship between disposal issues and the conservation of natural resources.

Policy CI14.1 Utilize a variety of feasible processes, including source reduction, transfer, recycling, landfilling, composting, and resource recovery to achieve an integrated and balanced approach to solid waste management.

Programs
1. Seek federal and state funds for projects utilizing resource and material recovery processes.
2. Participate in resource and material recovery studies.
3. Continue recycling operations at County landfills; expand recycling operations to other landfills or resource recovery facilities.

Mountain Region Goals and Policies of the Circulation and Infrastructure Element

GOAL M/CI4. Ensure that infrastructure improvements are compatible with the natural environment of the region.

Policy M/CI4.1 Retain the natural channel bottom for all storm water drainage facilities and flood control channels when such facilities are required for a specific development. This protects wildlife corridors and prevents loss of critical habitat in the region.

Crest Forest Community Plan

Circulation and Infrastructure

Goal CF/CI5. Ensure adequate water sources and associated infrastructure to serve the needs of existing and future water users in the Crest Forest Community Plan area.

Policy CF/CI5.3 Support efforts to continue to improve cooperation and communication among water providers and the County in addressing water related issues.

3.11.3 Environmental Impacts and Mitigation Measures

This section analyzes the impacts associated with implementation of the proposed Project related to utilities. The impact analysis describes the methods used to determine the proposed Project’s impacts and lists the thresholds used to conclude the significance of an impact. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, as needed.

Impact Assessment Methodology

The methodology for analyzing impacts related to utilities include identification of the potential utilities that are likely to be used during proposed Project construction, operation, and maintenance activities. In addition, State, and local agency local laws, ordinances, regulations, and standards were analyzed to determine mitigation measures applicable to the proposed Project site.
Thresholds of Significance

The significance of potential utilities impacts were determined based on relevant State CEQA Guidelines, Appendix G. Using these thresholds, the proposed Project would be considered to have a significant impact related to utilities impacts if it were to:

- **U-1**: Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board.
- **U-2**: Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.
- **U-3**: Have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed.
- **U-4**: Result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project’s projected demand in addition to the provider’s existing commitments.
- **U-5**: Be served by a landfill with sufficient permitted capacity to accommodate the Project’s solid waste disposal needs.
- **U-6**: Comply with federal, State, and local statutes and regulations related to solid waste.
- **U-7**: Interfere with existing utility systems

The following threshold from the CEQA Appendix G Environmental Checklist is not relevant to the proposed Project and is not discussed further beyond the summary below:

- **XVII (b)** Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects.

Wastewater generated during construction would be limited to that generated by construction personnel and would be accommodated by temporary portable toilets brought to staging areas for construction crews. These portable toilets would be maintained by a licensed sanitation contractor. The licensed contractor would dispose of the waste at an off-site location and in compliance with standards established by the RWQCB. Operation of the proposed Project would not require permanent stationed employees or wastewater treatment facilities. Therefore, the proposed Project would not result in the construction of new water or wastewater treatment facilities or expansion of existing facilities. There would be no impact related to CEQA Threshold XVII (b).

Project Impacts

**Impact U-1: The Project could exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board (Less than Significant)**

The proposed Project would generate a minimal volume of wastewater. During construction, wastewater would be contained within portable toilet facilities and disposed of at an approved disposal site by a licensed sanitation contractor. Operation of the proposed Project would not require permanent stationed employees or wastewater treatment facilities. Therefore, the proposed Project would not exceed wastewater treatment requirements and impacts would be less than significant. No mitigation is required.
Impact U-2: The Project could require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects (Less than Significant)

Construction of the downstream stabilization buttress would occur over 4 to 6 months. Blanket and chimney drains would be installed in the liquefaction zone of the existing dam, and then the buttress would be constructed of earthen material against the downstream slope of the dam. The buttress would average 40 feet thick and extend beyond the current embankment toe. Stockpiled rock slope protection removed during site preparation would be replaced onto the buttress at the completion of construction.

The proposed Project would create a small amount of additional impervious surface. Existing seepage from the dam is minimal, and would be diverted around the work area during construction via a small drainage ditch or channel. Areas of permanent disturbance would be covered with gravel, vegetation, or other stabilizing treatment, which would still allow for water absorption and would lessen stormwater runoff. The proposed Project is designed to accommodate existing and projected stormwater flows and would not require the construction of additional new or expanded stormwater facilities. Impacts would be less than significant.

As discussed in more detail in Section 3.8 (Hydrology and Water Quality), stormwater runoff has the potential to cause impacts on water quality, cause erosion, and result in loss of soils. Implementation of the proposed Project SWPPP would be sufficient to manage stormwater runoff during construction.

Impact U-3: The Project would have sufficient water supplies available to serve the Project from existing entitlements and resources, or are new or expanded entitlements needed (Less than Significant)

During construction of the proposed Project, a water source would be required for soil compaction, dust suppression, concrete/grout/equipment wash-down (in designated areas per the SWPPP), concrete placement preparation, and possibly miscellaneous concrete or grout production. Based upon material to be compacted and dust control for the duration of the proposed Project, between 15 and 30 acre-feet of water may be used during construction. This water would be provided by the Crestline Village Water District. The availability of construction water would be verified prior to the issuance of a construction contract. However, due to the minimal amount of water required and the short duration (4 to 6 months) of construction, it is anticipated that sufficient water supplies would be available to serve the proposed Project from existing entitlements and resources, and that no new or expanded entitlements would be required. Impacts would be less than significant and no mitigation is required.

Impact U-4: The Project could result in a determination by the wastewater treatment provider which serves or may serve the Project that it has adequate capacity to serve the Project’s projected demand in addition to the provider’s existing commitments (Less than Significant)

Wastewater generated during construction would be contained within portable toilet facilities and disposed of at an approved site and no wastewater would be generated during operation and maintenance. Due to the temporary and short-term nature of construction activities, the volume of wastewater generated during construction is not expected to exceed the capacity of wastewater treatment providers serving the portable toilet disposal site. Impacts would be less than significant and no mitigation is required.
Impact U-5: The Project would be served by a landfill with sufficient permitted capacity to accommodate the Project’s solid waste disposal needs (Less than Significant)

The County of San Bernardino Solid Waste Management Division (SWMD) is responsible for the operation and management of the County of San Bernardino’s solid waste disposal system which consists of five regional landfills and nine transfer stations. Material removed from the dam during preparation, including excessively saturated and organic material, would be hauled out and disposed of at an approved landfill (likely Heaps Peak Transfer Station located at 29898 SR-18 at Heaps Peak in Running Springs). Suitable soils in the existing dam would be reused in the buttress construction to the extent feasible, to minimize the amount of solid waste generated by the Project. Existing rock fill slope protection removed from the dam slope would be stockpiled and then reinstalled as slope protection on the buttress following construction. The proposed Project would generate a minimal amount of waste, and there is sufficient capacity in the County of San Bernardino solid waste disposal system to accommodate the solid waste disposal needs of the proposed Project. Impacts would be less than significant and no mitigation is required.

Impact U-6: The Project would comply with federal, State, and local statutes and regulations related to solid waste (Less than Significant with Mitigation)

The proposed Project would generate solid waste during construction, thus requiring the consideration of waste reduction and recycling measures. The 1989 California Integrated Waste Management Act (AB 939) requires San Bernardino County to attain specific waste diversion goals. In addition, the California Solid Waste Reuse and Recycling Access Act of 1991, as amended, requires expanded or new development projects to incorporate storage areas for recycling bins into the proposed Project design.

During construction, the earthen material for the stabilization buttress would be obtained from local dredging and sediment removal projects as well as from the existing dam itself. Suitable soils in the existing dam would be reused in the buttress construction to the extent feasible, to minimize the amount of solid waste generated by the Project. The County has preliminarily identified the additional buttress source material as the sediment from the Lake Gregory Swim Beach Silt Management Project currently stockpiled at the Thousand Pines Camp in Crestline, additional Lake Arrowhead dredging material stockpiled at the Papoose Lake Dam in Lake Arrowhead, and material to be excavated from two borrow sites on the Thousand Pines Camp property. Additionally, existing rock fill slope protection removed from the dam slope would be stockpiled and then reinstalled as slope protection on the buttress following construction.

The proposed Project would generate a minimal amount of waste, and would not significantly impact the County of San Bernardino solid waste disposal system. Nevertheless, to ensure compliance with policies to reduce waste sent to landfills, Mitigation Measures U-1 and U-2 are proposed. These measures require recycling solid waste to the extent feasible and designating a storage area for recyclable materials on site. Implementation of these mitigation measures would reduce impacts to less than significant.

Mitigation Measures

MM U-1 Recycle Solid Waste. During construction activities, the San Bernardino County Special Districts Department shall reduce construction waste transported to landfills by recycling solid waste construction materials to the extent feasible.

MM U-2 Designate a Recyclable Materials Storage Area during Construction. During construction activities, the Building Inspector shall verify that the construction contractor has provided a fenced storage area for recyclable materials that is clearly identified for recycling. This
area shall be maintained on the site during construction. A site plan showing the recycling storage area shall be submitted to the San Bernardino County Special Districts Department and County of San Bernardino Solid Waste Management Division prior to the issuance of any grading or building permit for the site.

**Impact U-7:** The Project could interfere with existing utility systems (Less than Significant with Mitigation)

During construction, there is a potential for accidental disruption of utility systems located in the construction zone. This could include overhead utility lines, such as telephone and cable television, and buried utility lines, such as water, wastewater, and natural gas lines. Buried lines are more likely to be accidentally disrupted because their exact locations are sometimes difficult to determine and, therefore, can be unintentionally disrupted by construction activities involving ground disturbance, such as excavation.

The County is required by State law to contact Underground Service Alert and manually probe for existing buried utilities in the proposed Project area prior to any powered-equipment drilling or excavation. This would substantially reduce the risk of accidental upset of existing utility lines. In addition, proposed Project construction plans may require the temporary relocation of buried utility lines located in the construction zone. Therefore, some temporary service interruptions may be unavoidable. While any disruption in service would be temporary in nature, it would inevitably disrupt activities in the surrounding area that are dependent on those utilities.

During construction, the proposed Project would potentially interfere with the following utilities that occur along Lake Drive at the crest of the dam and would require temporary or permanent relocation:

- Crestline Sanitation District – sanitary sewer line
- Crestline Village Water District – 8-inch water line and two fire hydrant relocations
- Southern California Edison – overhead and underground electrical conduit and cable
- Verizon – Buried conduit and cable
- Southern California Gas Company – gas main pipeline

MM U-3 would require the County to notify the public if there were to be an interruption in any utility services, thereby allowing affected parties to prepare for such disruption. Implementation of this mitigation measure would reduce impacts from utility disruptions to less than significant.

**Mitigation Measure**

**MM U-3 Notify the Public of Utility Service Interruptions.** Prior to Project construction in which a utility service interruption is known to be unavoidable, the San Bernardino County Special Districts Department (County) shall notify members of the public, the jurisdiction, and the service providers that would be affected by the planned outage by mail. The County shall also publish notice in a newspaper of local jurisdiction. The notice shall specify the estimated duration of the planned outage, and shall be published no less than seven days prior to the outage.

**3.11.4 Level of Significance After Mitigation**

Impacts related to solid waste and utility interruptions would be reduced to less than significant with the implementation of mitigation measures U-1 through U-3. All other impacts related to utilities would be less than significant and would not require mitigation.
3.12  Recreation and Fisheries

The following discussion addresses existing recreational resources within and surrounding the Project area. The affected environment for this analysis describes the baseline conditions, or existing environmental conditions that contribute to recreational resources, and also provides the existing laws and regulations relevant to those resources. For the purposes of this analysis, the recreation study area includes recreational resources within 0.5 mile of the Project sites. This is an appropriate study area for recreation because it captures all major recreation resources that contribute to baseline conditions and could potentially be affected by activities related to the Project.

3.12.1 Environmental Setting

Construction activities would require use of the existing access road that goes through Camp Switzerland, and the majority of the dam improvement activities would occur in and adjacent to the boundaries of the campground. Camp Switzerland is a private campground with cabins, tent-camping, and RV hook-ups. In addition to camping, recreation activities at the campground may include hiking, nature walks, and picnics.

The dam improvements would occur across the street from Lake Gregory Regional Park (less than 100 feet); and the temporary relocation of Lake Drive and temporary or permanent relocation of utilities buried in Lake Drive would occur less than 50 feet from the park/lake. This park was originally a privately built and owned recreational facility, and has been in operation since the completion of the dam on October 26, 1938. The San Bernardino County Regional Parks Department (Regional Parks) took ownership of the dam, lake, the water in the lake, and the park on November 7, 1977 from the Crest Forest County Water District and now operates the Park as a public facility. Within the Park, the 81-acre lake is operated for public recreation, and is primarily used for swimming, boating, and fishing. Within the swimming area, visitors can play on the two 300-foot waterslides, or rent the following equipment: paddleboards, rowboats, paddleboats, sailboats, motor boats, canoes, kayaks, wind surfboards, and aqua cycles. The swimming area includes sandy beaches, rest rooms, two snack bars, grills, picnic tables, picnic shelters, and sand volleyball courts. The Lake Gregory Fitness Trail surrounding the lake is a 2.5-mile loop, which includes 10 exercise stations for high-impact exercise and benches for passive recreation. (CBC, 2005a and 2005b)

Based on the Fishery Assessment prepared for Lake Gregory in 2013, the lake is stocked annually with brown trout and rainbow trout by the California Department of Fish and Wildlife (CDFW), and Regional Parks allows shore fishing year-round. In addition, this assessment includes a fish survey from 2010 that identified eight additional species including black crappie, bluegill, brown bullhead, goldfish, prickly sculpin, common carp, largemouth bass, and tule perch (Lilburn, 2013). Other recreation activities at Lake Gregory include an annual egg hunt and duck derby race in April, the Crestline Wine and Stein Walk through the Pines on the first Saturday of the month from May through October, a street fair and fireworks show in July, an annual 5K and 10K run around Lake Gregory in August, a Dragon Boat race in August, a Pine Cone Festival in October, and the Crestline Holiday Bonfire at the North Beach of Lake Gregory in December. (Chamber, 2015)

The existing stockpile retrieval and proposed borrow sites for the Project are located at the Thousand Pines Christian Camp and Conference Center and the Ponderosa Camp. The Thousand Pines Christian Camp includes the following facilities: paintball, Ropes/Confidence Course, Frisbee golf, a swimming pool, and a skate park. Games and tournaments are held for the following sports: football, soccer, volleyball, basketball, foosball, air hockey, ping pong, horseshoes, and laser tag. In addition, other recreation activities within the campgrounds may include mountain biking and hiking. The Ponderosa Camp is a
smaller camp area that is owned and operated by the Thousand Pines Christian Camp. Ponderosa Camp includes cabins, large field for games, an outdoor amphitheater for seasonal use, a low Ropes course, a tree house, and a giant swing. (Thousand Pines, 2014)

The Ponderosa West and Ponderosa East borrow sites are up to 1.5 acres each, located on property known as the Ponderosa Camp that is owned by the Thousand Pines Christian Camp. The Ponderosa East Borrow Site location is approximately one mile west of Lake Gregory Dam, and the Ponderosa West Borrow Site location is approximately 600 feet west of the Ponderosa East Borrow Site. The Ponderosa Camp area includes cabins, an amphitheater, a low ropes course, general store, swimming pool, and skate park (Thousand Pines, 2015). However, the immediate vicinity of both borrow site areas consists of montane coniferous forest similar to that near the dam, and they are within a portion of the camp property that is not routinely used for camp activities.

Other recreation activities that may occur within the mountainous areas surrounding the Project site may include hiking, mountain biking, and nature walks. Also, Mountain High School is located across Lake Gregory, approximately 1,800 feet east of the construction activities. Facing the lake, there is a large field for recreation activities and two basketball courts.

### 3.12.2 Applicable Regulations, Plans, and Standards

**San Bernardino County Open Space Element**

The San Bernardino County Open Space Element works as a reference guide to facilitate the protection and preservation of open space, recreation, and scenic areas. It provides policies for protecting and preserving the County’s natural resources and open space. It identifies open space and recreation areas as an important quality-of-life factor. The following goals and policies are relevant to recreation issues related to the Project:

**GOAL OS 4.** The County will preserve and protect cultural resources throughout the County, including parks, areas of regional significance, and scenic, cultural and historic sites that contribute to a distinctive visual experience for visitors and quality of life for County residents.

**Policy OS 4.2** The County will preserve and encourage the management of suitable land for greenbelts, forests, recreation facilities and flood control facilities to assist the County’s efforts to provide adequate water supply, achieve air quality improvement, and provide habitat for fish, wildlife and wild vegetation.

**GOAL OS 7.** The County will minimize land use conflict between open spaces and surrounding land uses.

**Policy OS 7.1** Control access to lands used for open space purposes as appropriate to retain the desirable open space attributes of the land.

**Policy OS 7.2** For natural open space areas that require separation from human activity to preserve their function and value, limit construction of roads into or across natural open space areas.

**Policy OS 7.5** Require that natural landform and ridgelines be preserved by using the following measures:

a. Keep cuts and fills to an absolute minimum during the development of the area.

b. Require the grading contours that do occur to blend with the natural contours on site or to look like contours that would naturally occur.
c. Encourage the use of custom foundations in order to minimize disruption of the natural landform.

d. Require that units located in the hillsides be so situated that roof lines will blend with and not detract from the natural ridge outline.

Policy OS 7.6 Require that hillside development be compatible with natural features and the ability to develop the site in a manner that preserves the integrity and character of the hillside environment, including but not limited to, consideration of terrain, landform, access needs, fire and erosion hazards, watershed and flood factors, tree preservation, and scenic amenities and quality.

Crest Forest Community Plan

The Conservation goals and policies within this plan primarily focus on the development of parks and recreation facilities. Therefore, none of the goals and policies related to recreational resources apply to the proposed Project. The Open Space Element of the Community Plan includes Goal OS-4 Support and encourage efforts to improve the Lake Gregory Regional Park, and Policy OS 4.2 Ensure proper maintenance and improvements to Lake Gregory Regional Park. This Project is consistent with the noted goal and policy of the Community Plan Open Space Element, as the dam is an integral part of Lake Gregory.

3.12.3 Environmental Impacts and Mitigation Measures

This section analyzes the recreation impacts associated with implementation of the proposed Project. The impact analysis describes the methods used to determine the proposed Project’s impacts and lists the thresholds used to conclude the significance of an impact. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, as required.

Impact Assessment Methodology

The methodology for analyzing recreation impacts includes identifying general types of disruptions that would occur during proposed Project construction, operation, and maintenance activities.

Thresholds of Significance

The significance of potential impacts to recreational resources and fisheries were determined based on relevant State CEQA Guidelines, Appendix G. Using these thresholds, the proposed Project would be considered to have significant impacts if it were to:

- **RF-1**: Increase the use of existing neighborhood and regional parks or other recreational facilities such that the physical deterioration of the facility would occur or be accelerated.

In addition, the following criterion has been added for potential disruptions to existing recreation:

- **RF-2**: Conflict with or preclude permitted recreation activities or interfere with fishing activities.

The following threshold from the CEQA Appendix G Environmental Checklist is not relevant to the proposed Project and is not discussed further beyond the summary below:

- **XV (b)** Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment.

The proposed Project includes the construction of physical improvements to the dam, earthen material hauling and processing, relocation of utilities on Lake Drive, excavation of earthen material from two
borrow sites, and interim traffic detour routes. During the operation period, maintenance activities would include vegetation control on the face of the buttress, debris and trash removal, erosion and slope repair, and routine inspections. Therefore, at no time during the construction or operation periods would construction or expansion of recreation facilities occur. There would be no impact related to CEQA Threshold XV (b).

Project Impacts

**Impact RF-1:** The Project could increase the use of existing neighborhood and regional parks or other recreational facilities such that the physical deterioration of the facility would occur or be accelerated (Less than Significant)

The proposed Project includes a construction period that would occur in four phases over a maximum of 12 months. The number of construction workers is estimated to be a maximum of 20 workers per phase. Operation and maintenance activities would be similar to the current requirements at the dam, and would include vegetation control on the face of the buttress, debris and trash removal, erosion and slope repair, and routine inspections, which would be performed by existing County staff resources, and would not require additional employment needs.

All of the construction workers are expected to live in the surrounding mountain communities or commute from the valley area in southern San Bernardino County. Due to the small labor force needed for construction and the short duration of construction, a temporary or permanent increase in population would not occur from new employment. During the operation and maintenance period of the Project, maintenance activities would occur periodically by a small maintenance crew. Existing recreational areas or facilities would not experience increased use as a result of new employment for construction or operation, and would not result in significant impacts to the existing recreation facilities. Therefore, Impact REC-1 would be less than significant and no mitigation is required.

**Impact RF-2:** The Project could conflict with or preclude permitted recreation activities or interfere with fishing activities (Less than Significant with Mitigation [Significant and Unavoidable if lake must be lowered])

The majority of the construction activities would occur within or at the boundary of Camp Switzerland, and up to 70,000 cubic yards of material would be imported from the Thousand Pines Christian Camp stockpile, borrow sites, and from the stockpile at Papoose Dam. However, due to the required dam improvements for public safety, the Camp Switzerland grounds have been closed until the proposed Project is completed. Therefore, there would be no impact to recreation users at Camp Switzerland during the construction period.

Retrieval of stockpiles at the Thousand Pines Camp and excavation of materials from the two borrow sites at the Ponderosa Camp, could result in temporary impacts to recreation areas or activities at these locations during the construction period. In particular, general construction nuisances would occur, which would include degraded aesthetics of the natural forest area, decreased air quality due to emissions from construction equipment and dust, and increased noise levels. These impacts are analyzed in detail in Section 3.2 (Aesthetics), Section 3.3 (Air Quality and Climate Change), Section 3.10 (Noise), and Section 3.13 (Traffic and Transportation), respectively. Mitigation measures for these impacts include the following: MM AES-1 (Minimize Lighting Impacts), MM AQ-1 (Fugitive Dust Control), MM NOI-1 (Construction Noise Complaint Plan), MM TR-1 (Construction Traffic Management Plan), MM TR-2 (Traffic Control Plan for Lake Drive and Detours), and MM TR-3 (Notification to Property Owners and Tenants). These measures require minimization of light impacts to offsite areas, dust control, a mechanism for the public to notify the County about disruptive noise, implementation of a Traffic Management Plan to ensure
the Project does not present safety hazards along affected roadways, notification to affected parties regarding scheduling and duration of haul truck activity, and a Traffic Control Plan for the Lake Drive closure or relocation. With implementation of these measures, the temporary nuisance impacts to recreational resources at the Thousand Pines Christian Camp and Ponderosa Camp would be mitigated to a less-than-significant level.

As discussed above in the Environmental Setting (Section 3.12.1), extensive recreation activities occur within Lake Gregory and the trail that surrounds the lake. Construction activities would occur during the summer months when public use of the lake is greatest and the lake draws tourism. As stated in Section 2 (Project Description), the proposed Project would first seek to avoid lowering Lake Gregory water levels during construction. In the event construction does not require lowering the water level, fishing and recreational water/beach use would not be affected. Therefore, construction of the proposed Project would create nuisances for recreation users, like noise and traffic, but there would be no restrictions or preclusions to activities within the lake should the lake level not be lowered during construction.

However, as stated in Section 2 (Project Description), the lake level may need to be lowered up to 10 feet (if required by the California Department of Water Resources, Division of Safety of Dams [DSOD]) during construction. In the event the lake level is lowered up to 10 feet, it would likely result in closure of the swim beach recreational area. In that area, the lake is not deep enough to support normal water recreation activities should the overall lake level be lowered by 10 feet. The lake would be accessible for fishing during Project construction, although the lowered water level would alter normal fishing patterns. Therefore, in the event DSOD requires lowering the lake level up to 10 feet during construction of the Project, impacts to recreation activities at the Lake Gregory Regional Recreation Area would be significant and unavoidable. There is no feasible mitigation to reduce this impact.

Mitigation Measures

**MM AES-1 Minimize Lighting Impacts.** See Section 3.2 (Aesthetics) for the full text of this measure.

**MM AQ-1 Fugitive Dust Control.** See Section 3.3 (Air Quality and Greenhouse Gas Emissions) for the full text of this measure.

**MM NOI-1 Implement Best Management Practices During Construction.** See Section 3.10 (Noise) for the full text of this measure.

**MM TR-1 Construction Traffic Management Plan.** See Section 3.13 (Traffic and Transportation) for the full text of this measure.

**MM TR-2 Traffic Control Plan for Lake Drive and Detours.** See Section 3.13 (Traffic and Transportation) for the full text of this measure.

**MM TR-3 Notification to Property Owners and Tenants.** See Section 3.13 (Traffic and Transportation) for the full text of this measure.

**3.12.4 Level of Significance After Mitigation**

The proposed Project would not appreciably increase the use of existing neighborhood and regional parks or other recreational facilities such that the physical deterioration of the facility would occur or be accelerated, and this impact would be less than significant. Implementation of the mitigation measures listed above would reduce the Project’s impacts to recreational resources and fisheries to a less-than-significant level, as long as the lake water level is not lowered during construction. In the event DSOD requires lowering the lake level up to 10 feet during construction of the Project, impacts to recreation
activities at the Lake Gregory Regional Recreation Area would be significant and unavoidable. There is no feasible mitigation to reduce this impact.
3.13 Traffic and Transportation

The following sections summarize the traffic and transportation analysis, which includes an evaluation of the Project’s impacts on vehicular traffic as well as public transit and non-motorized transportation (bicycles and pedestrians). The existing conditions on the study area’s transportation facilities are described in the Environment Setting section, which is followed by a discussion of the applicable regulations, plans, and standards. Next is a presentation of the anticipated Project impacts and recommended mitigation measures.

3.13.1 Environmental Setting

The proposed Project site is in an unincorporated area of western San Bernardino County in the community of Crestline. It is in the San Bernardino Mountains approximately 14 miles north of the City of San Bernardino. Access to the Project area is provided by four State of California highways and numerous local roadways. The four State highways are State Route 18 (SR 18), SR 138, SR 173, and SR 189. These highways are owned and operated by the State of California Department of Transportation (Caltrans). Figures 3.13-1 and 3.13-2 show the local and regional transportation network, as well as the predicted haul routes associated with the proposed Project.

SR 18 extends north from the City of San Bernardino through the San Bernardino National Forest to Crestline, then runs east to Lake Arrowhead and Big Bear Lake. It is also called Rim of the World Highway. SR 138 begins at SR 18 in Crestline and extends north to Silverwood Lake then westerly to Interstate 15. SR 173 begins at SR 18 south of Lake Arrowhead and extends northeasterly around the east side of Lake Arrowhead (adjacent to Papoose Lake), then runs northwesterly to a terminus north of Lake Arrowhead. SR 189 begins at Lake Gregory Drive immediately north of SR 18, southeast of Lake Gregory and extends in a northeasterly direction to intersect with SR 173 on the south side of Lake Arrowhead.

The existing number of lanes on the State highways, the average daily traffic volumes, and the peak hour traffic volumes are shown in Table 3.13-1. The lane information was obtained through field observations and the traffic volume data were obtained from the Caltrans website cited in the table’s footnote.

<table>
<thead>
<tr>
<th>Roadway/Location</th>
<th>Number Of Lanes</th>
<th>Average Daily Traffic Volume</th>
<th>Peak Hour Traffic Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>State Route 18</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West of SR 138</td>
<td>4</td>
<td>15,500</td>
<td>1,700</td>
</tr>
<tr>
<td>SR 138 to Lake Gregory Drive</td>
<td>2</td>
<td>8,000</td>
<td>870</td>
</tr>
<tr>
<td>Lake Gregory Drive to Daley Canyon Road</td>
<td>2</td>
<td>9,000</td>
<td>970</td>
</tr>
<tr>
<td>Daley Canyon Road to SR 173</td>
<td>2</td>
<td>10,500</td>
<td>1,150</td>
</tr>
<tr>
<td>East of SR 173</td>
<td>2</td>
<td>5,000</td>
<td>540</td>
</tr>
<tr>
<td><strong>State Route 138</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SR 18 to Crest Forest Drive</td>
<td>2</td>
<td>6,800</td>
<td>650</td>
</tr>
<tr>
<td>Crest Forest Drive to Knapps Cutoff</td>
<td>2</td>
<td>2,700</td>
<td>260</td>
</tr>
<tr>
<td>Knapps Cutoff to Waters Drive</td>
<td>2</td>
<td>5,300</td>
<td>510</td>
</tr>
<tr>
<td>North of Waters Drive</td>
<td>2</td>
<td>1,600</td>
<td>170</td>
</tr>
</tbody>
</table>
The local roadways in the Project area that would be used as access routes for construction workers, construction equipment, and the hauling of earthen material to the stabilization buttress include Lake Drive, Lake Gregory Drive, San Moritz Drive, Pine Ridge Road, Weissborn Drive, Wabern Drive, Wylerhorn Drive, Zurich Drive, Gregory Place, and Thousand Pines Road. Figures 3.13-1 and 3.13-2 show the local and regional transportation network, as well as the predicted haul routes associated with the proposed Project.

Lake Drive begins at SR 138 and extends east through the Crestline community to Lake Gregory. It runs along the north side of the lake and on top of the dam. Lake Gregory Drive intersects with Lake Drive near the northwest corner of Lake Gregory and runs in a southwesterly direction to SR 18. San Moritz Drive intersects with Lake Gregory Drive near the southwest corner of Lake Gregory and runs easterly along the south side of the lake. It intersects with Lake Drive east of Lake Gregory.

Pine Ridge Road, Weissborn Drive, Wabern Drive, Wylerhorn Drive, Zurich Drive, and Gregory Place are the roadways that provide a travel route from the existing stockpile for the earthen material at Thousand Pines Camp to the Project site via Lake Drive. Gregory Place intersects with Lake Drive near the northwest corner of Lake Gregory. Thousand Pines Road, Zurich Drive, Gregory Place, and Lake Drive are the roadways that provide a travel route from the Ponderosa East and Ponderosa West borrow sites to the Project site.

The existing number of lanes on the local roadways in the study area and the average daily traffic volumes are shown in Table 3.13-2. These roadways are all under the jurisdiction of the San Bernardino County Department of Public Works. The lane information was obtained through field observations and the traffic volume data were obtained from the County of San Bernardino website cited in the table’s footnote. As the traffic volume data shown on the website were collected on various years, the traffic volumes were adjusted to the present year of 2015 by applying a one percent annual growth rate, as recommended in “Traffic Volume Expansion Factors” (County of San Bernardino, 2012).
3. ENVIRONMENTAL SETTING, ANALYSIS, AND MITIGATION MEASURES

Figure 3.13-1
Localized Haul Routes

- Borrow Site Material Haul Route
- Stockpile Material Haul Route
- Project Area - See Figure 2-4
- Existing Stockpile Area
- Borrow Site
Regional Material Source Locations/Haul Routes

Figure 3.13-2

- **Lake Gregory Dam Project Area**
- **Haul Routes from Quarries**
- **Haul Route from Papoose Dam Stockpile**
Table 3.13-2. Local Roadways in Project Area

<table>
<thead>
<tr>
<th>Roadway/Location</th>
<th>Number Of Lanes</th>
<th>Average Daily Traffic Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Lake Drive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northeast of SR 138</td>
<td>2</td>
<td>6,020</td>
</tr>
<tr>
<td>West of Lake Gregory Drive</td>
<td>2</td>
<td>11,670</td>
</tr>
<tr>
<td>East of Lake Gregory Drive</td>
<td>2</td>
<td>3,800</td>
</tr>
<tr>
<td><strong>Lake Gregory Drive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South of Lake Drive</td>
<td>2</td>
<td>8,180</td>
</tr>
<tr>
<td>North of SR 189</td>
<td>2</td>
<td>6,040</td>
</tr>
<tr>
<td><strong>San Moritz Drive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>East of Lake Gregory Drive</td>
<td>2</td>
<td>1,690</td>
</tr>
<tr>
<td>West of Arosa Drive</td>
<td>2</td>
<td>420</td>
</tr>
<tr>
<td><strong>San Moritz Way</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>South of Lake Drive</td>
<td>2; 1 (south of high school)</td>
<td>330</td>
</tr>
<tr>
<td><strong>Weisshorn Drive (Pine Ridge Road) – North of Wabern Drive</strong></td>
<td>2</td>
<td>430</td>
</tr>
<tr>
<td><strong>Wabern Drive – East of Weisshorn Drive</strong></td>
<td>2</td>
<td>840</td>
</tr>
<tr>
<td><strong>Wylerhorn Drive – North of Zurich Drive</strong></td>
<td>2</td>
<td>1,380</td>
</tr>
<tr>
<td><strong>Zurich Drive</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>West of Gregory Place</td>
<td>2</td>
<td>970</td>
</tr>
<tr>
<td>West of Thousand Pines Road</td>
<td>2</td>
<td>1,120</td>
</tr>
<tr>
<td><strong>Gregory Place – North of Lake Drive</strong></td>
<td>3</td>
<td>2,900</td>
</tr>
<tr>
<td><strong>Thousand Pines Road – Northeast of Zurich Drive</strong></td>
<td>2</td>
<td>1,200</td>
</tr>
</tbody>
</table>

Source: County of San Bernardino, Department of Public Works, Traffic Division. Website: www.sbcounty.gov/dpw/trafficadt/AvgDailyTraffic.aspx

Note: As the traffic volume data shown on the website were collected on various years, the traffic volumes were adjusted to the present year of 2015 by applying a one percent annual growth rate, as recommended in “Traffic Volume Expansion Factors” (County of San Bernardino, 2012)

With regard to traffic control devices in the study area, the intersections are controlled with stop signs except for the intersection of SR 18 and Lake Gregory Drive, which has a traffic signal. With regard to pedestrian circulation, most of the roadways in the Project vicinity are not equipped with sidewalks, so pedestrians generally walk along the shoulder of the roadways. Non-continuous sidewalks are in place in the business district of Crestline on parts of Lake Drive, Lake Gregory Drive, and Gregory Place and unpaved sidewalks are located on the north side of San Moritz Drive and the south side of Lake Drive along the perimeter of Lake Gregory. Bicyclists either share the roadway with vehicular traffic or use the shoulders and sidewalks.

Public transportation in the Project area is provided by the Mountain Area Regional Transit Authority (Mountain Transit), which operates three bus lines. Route 2 provides service to Valley of Enchantment, Crestline, Twin Peaks, Blue Jay, and Lake Arrowhead and runs along SR 138, Lake Drive, Lake Gregory Drive, SR 18, and SR 189. Route 4 provides service to Lake Arrowhead and Running Springs and runs along SR 173 and SR 18. The Rim Off-The-Mountain route provides service to Lake Arrowhead, Blue Jay, Rimforest, Crestline, and San Bernardino and runs along SR 189, SR 18, Lake Gregory Drive, Lake Drive, and SR 138. Route 2 and the Rim Off-The-Mountain route have bus stops at the intersection of Lake Drive and Lake Gregory Drive.
3.13.2 Applicable Regulations, Plans, and Standards

The roadway network within the study area is within the jurisdiction of two public agencies: the County of San Bernardino and the State of California Department of Transportation (Caltrans). These agencies are responsible for the operation and maintenance of the study area roadways. The State highways, which include SR 18, SR 138, SR 173, and SR 189, are in Caltrans’ jurisdiction. The other roadways are in the jurisdiction of San Bernardino County. Any modifications to the roadway network would be subject to approval by the responsible public agency and any construction work within the right-of-way of any public roadway would require the issuance of an encroachment permit by the responsible agency. Additional details regarding the regulatory setting are presented below for the various levels of government.

State

The operation of any vehicle on the public roadways is subject to the regulatory requirements of the California Vehicle Code regardless of the roadway’s jurisdiction (DMV, 2014). Caltrans has the discretionary authority to issue special permits for the movement of vehicles or loads that exceed the statutory limits on size or weight. Caltrans also has the authority to issue encroachment permits for the use of the State highways for purposes other than normal transportation (e.g., construction activities).

Regional

Regional planning for the Project area is conducted by the Southern California Association of Governments (SCAG), which is the designated Metropolitan Planning Organization (MPO) for a six-county region, including Los Angeles, Orange, Riverside, San Bernardino, Ventura, and Imperial Counties. SCAG is responsible for preparing a Regional Transportation Plan (RTP). Regional planning is also conducted by the San Bernardino Associated Governments (SANBAG). This agency administers the San Bernardino County Congestion Management Program (CMP), which is mandated by State of California law. This law requires that the traffic generated by individual development projects be analyzed for potential impacts to the regional roadway system.

Local

The roadways in unincorporated San Bernardino County must also be consistent with the Circulation and Infrastructure Element of the County of San Bernardino General Plan, which presents goals and objectives for the County’s transportation system and establishes a hierarchy of roadway classifications with specific functions and geometric standards for each category. The General Plan addresses vehicular travel as well as alternative modes of transportation such as public transit, bicycles, and pedestrians. The operation of any vehicle on the public roadways is subject to the regulatory requirements of the California Vehicle Code and the County of San Bernardino Code of Ordinances.

3.13.3 Environmental Impacts and Mitigation Measures

This section analyzes the potential traffic and transportation impacts from implementation of the proposed Project. The impact analysis describes the methods used to determine the proposed Project’s impacts and lists the thresholds used to conclude the significance of an impact. Measures to mitigate (avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany each impact discussion, as needed.
Impact Assessment Methodology

The methodology used to assess the impacts on transportation and traffic conditions involves comparing the actions associated with the Project against the environmental setting presented in Section 3.13.1, with consideration of the significance criteria identified in Appendix G of the State CEQA Guidelines. The proposed Project would have a greater impact on the ground transportation system (roads) during construction than during O&M because there is typically only a minimal amount of activity required to operate and maintain the dam once construction is completed. The traffic analysis, therefore, focuses on the potential impacts during construction.

Thresholds of Significance

The significance of potential traffic and transportation impacts were determined based on relevant State CEQA Guidelines, Appendix G. Using these thresholds, the proposed Project would be considered to have a significant impact if it would:

- **TR-1**: Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including but not limited to intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit.

- **TR-2**: Conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways.

- **TR-3**: Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

- **TR-4**: Result in inadequate emergency access.

- **TR-5**: Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities.

The following threshold from the CEQA Appendix G Environmental Checklist is not relevant to the proposed Project and is not discussed further beyond the summary below:

- **XVI (c)** Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks.

  As the Project is not located near any airports, and it would have no impact on air traffic patterns or safety, there would be no impact related to CEQA Threshold XVI (c).

Project Impacts

**Impact TR-1: The Project could conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system (Less than Significant with Mitigation)**

There are two primary categories of traffic and transportation impacts that have been evaluated for the proposed Project. The first category is the impacts associated with construction traffic on the roadways that provide access to the Project area. The construction activities would generate vehicular traffic that would be traveling to and from the Project area on the public roads and highways, including trucks delivering equipment to the Project site, trucks hauling earthen material to the stabilization buttress,
trucks transporting waste material away from the construction site, and construction workers’ vehicles commuting to and from the Project site.

The second category of traffic and transportation impacts is the disruption to traffic, pedestrian, and bicycle circulation associated with the temporary relocation or closure of Lake Drive along the top of the Lake Gregory Dam. The impacts associated with these two construction categories have been evaluated for the affected roadways. There is typically a third category of traffic and transportation impacts, which involves the operation of the proposed Project after construction is complete. This issue is not addressed in this EIR because the operation of the rehabilitated dam would be essentially the same as the operation of the existing dam.

**Construction Trip Generation Impacts.** Based on the construction plan detailed in Section 2.3.1, the anticipated levels of Project-generated construction traffic are shown in Table 3.13-3. The table shows the projected number of employee vehicle trips (automobiles and light-duty vehicles) and truck trips for each phase of the Project. Table 3.13-3 shows the worst-case trip generation scenario, which represents the combined traffic volumes generated during overlap of Phase 2 and 3 construction activities. As shown on Table 3.13-3, the volume of Project generated traffic for the worst-case scenario would be 250 vehicle trips per day (34 employee vehicles, 208 haul trucks, and eight other trucks). During the worst-case peak hour (overlap of Phase 2 and 3 construction activities), the Project would generate 34 employee vehicle trips and up to 24 truck trips (note, this assumes implementation of Mitigation Measure TR-1, which is discussed below and requires implementation of a Traffic Management Plan to ensure truck trips avoid peak hour travel).

<table>
<thead>
<tr>
<th>Vehicle Type</th>
<th>Vehicle Trips/Day (Round Trips for Daily Traffic)</th>
<th>Worst Case (Phases 2 &amp; 3 Combined)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Phase 1</td>
<td>Phase 2</td>
</tr>
<tr>
<td>Employee Vehicle (autos &amp; light-duty)</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>Haul Trucks</td>
<td>0</td>
<td>177</td>
</tr>
<tr>
<td>Other Trucks</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total Daily Trips</strong></td>
<td><strong>36</strong></td>
<td><strong>195</strong></td>
</tr>
<tr>
<td><strong>Peak Hour Trips</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Automobiles/Light-Duty Vehicles</td>
<td>20</td>
<td>14</td>
</tr>
<tr>
<td>Trucks</td>
<td>6</td>
<td>20</td>
</tr>
</tbody>
</table>

The employee vehicle trips and the trips associated with the trucks other than the haul trucks represent relatively minor traffic volumes and the drivers would use multiple roadways while traveling to and from the Project site. The impacts of these traffic volumes would be negligible. The haul trucks, however, would result in worst-case of 208 trips per day and would have a specific travel route between the stockpile or source locations and the Project site. These trucks would result in a significant traffic impact. All empty haul trucks would exit the Project site at the Camp Switzerland back gate on Lake Drive near the west end of the dam and travel back to the stockpile along the roads listed previously.

The initial source for the earthen material would be the existing stockpile at Thousand Pines Christian Camp and the proposed Ponderosa East and West borrow sites. The haul routes between these locations and the Project site are shown in Figure 3.13-1. In addition to these sources, material would also be hauled to the Project site from a stockpile at Papoose Lake in Lake Arrowhead. The haul routes between this location and the Project site is shown in Figure 3.13-2. The trips along these haul routes would occur during Phases 2 and 3.
The County has preliminarily identified two quarries in the San Bernardino valley area from which to source commercially obtained material, as needed. These quarries are located at the 8200 block of Alabama Street in Redlands and the 2400 block of West Highland Avenue in San Bernardino. The haul routes between these locations and the Project site are shown in Figure 3.13-1. A maximum of 45 trips per day along these haul routes are assumed to occur, as needed, for up to 45 days during Phases 2 and 3.

Peak hour trips shown in Table 3.13-3 are minor compared to the roadway capacities and existing traffic volumes on the study area roadway network (see Tables 3.13-1 through 3.13-3). However, Mitigation Measures TR-1 and TR-2 are proposed to reduce the impacts associated with trip generation during construction. These measures require implementation of a Traffic Management Plan to ensure truck trips avoid peak hour travel, as well as a Traffic Control Plan for the Lake Drive closure or relocation. Additionally, these measures address Project-generated traffic during construction and safety issues relative to the haul truck traffic on the local roadways between the Thousand Pines and Ponderosa borrow sites and the Project site. These roadways, which are shown in Figure 3.13-1, are generally narrow, rural, residential streets with horizontal and vertical curves typical of roads in a mountainous terrain. The presence of haul trucks on these streets would result in decreased traffic flow, particularly when haul trucks would be traveling in opposite directions simultaneously on a narrow roadway segment or at an intersection. The presence of haul trucks would be a nuisance to the affected residents and businesses and the frequent truck activity could potentially result in pavement damage and dirt spillage on the streets and roadways along the haul routes. Implementation of these measures would reduce temporary impacts from Project-related construction traffic (particularly truck trips) to a less-than-significant level.

**Roadway and Travel Lane Disruption Impacts.** The second category of traffic and transportation impacts is the temporary disruption to traffic, pedestrian, and bicycle circulation associated with the three options for traffic control during construction (as presented in Section 2.3.1.6). These road closure/relocation options are needed to provide sufficient space to accommodate construction activities at the top of the dam structure. It is proposed that a temporary asphalt road may be constructed parallel to and south of the existing Lake Drive alignment to accommodate vehicular traffic as well as bicycles and pedestrians.

The temporary closure, partial closure, or relocation of Lake Drive as included with Options 1 and 3 would have a significant impact on circulation and safety for vehicular traffic, pedestrians, and bicycles that traverse this segment of Lake Drive. Additionally, both Options 1 and 2 would result in traffic volumes from Lake Drive being redirected to small residential streets. Option 2 would maintain two travel lanes on Lake Drive. However, it is likely that traffic flow would be slow through this segment during work hours, with pedestrian and bicycle movements temporarily limited or restricted. Furthermore, the planned detour route requires San Moritz Way be temporarily changed from one-way travel to two-way. These temporary changes to the roadway network would disrupt circulation patterns.

Mitigation Measures TR-1 through TR-5 are proposed to reduce the impacts associated with implementing any of the three options for traffic control during construction. These measures require implementation of a Traffic Management Plan to ensure the Project does not present safety hazards along affected roadways, a Traffic Control Plan for the Lake Drive closure or relocation and all associated detours, notification to affected parties regarding scheduling and duration of haul truck activity, coordination with emergency service providers to maintain emergency access, and repair of all roadway damage upon Project completion. Implementation of these measures would reduce traffic and roadway impacts from temporary roadway and travel lane disruptions to less than significant.
Mitigation Measures

**MM TR-1  Construction Traffic Management Plan.** A construction traffic management plan shall be prepared that will include but not be limited to such measures as designated haul routes for trucks, travel time restrictions for trucks to avoid peak periods on selected roadways (ensuring truck trips to quarries in the San Bernardino valley area avoid peak hour travel), designated site access locations, driveway turning restrictions, temporary traffic controls and/or flaggers, and designated parking/staging locations for workers and equipment. The plan shall include requirement for at-least daily street sweeping for spills that may occur. This plan shall be subject to review, approval, and inspection by the County of San Bernardino Department of Public Works and/or Caltrans (for State highway segments).

**MM TR-2  Traffic Control Plan for Lake Drive and Detours.** A construction area traffic control plan and/or detour plan shall be prepared for the closure, partial closure, and/or relocation of Lake Drive on the dam structure, as well as all detour routes. The plan would include, but not be limited to such features as warning signs, detour signs, lights, barricades, cones/delineators, concrete barriers, temporary traffic signals, flaggers, and accommodations for bicycle and pedestrian circulation. This plan or plans shall be subject to review, approval, and inspection by the County of San Bernardino Department of Public Works.

**MM TR-3  Notification to Property Owners and Tenants.** The Project proponent and/or its contractor shall provide a minimum of 48-hours advance written notification to affected property owners and tenants along the haul routes to inform them about the scheduling and duration of the trucking activities and coordinate any special access or circulation concerns.

**MM TR-4  Coordinate with Emergency Service Providers.** The Project proponent and/or its contractor shall coordinate with emergency service providers (police, fire, and ambulance/paramedic agencies) prior to construction to provide information regarding haul routes, construction schedules, lane closures, etc. and to develop a plan to maintain or accommodate essential emergency access routes.

**MM TR-5  Pavement Rehabilitation.** The Project proponent and/or its contractor shall conduct a before-and-after evaluation of pavement conditions along the earthen material haul routes to document any damage caused by the haul truck activities. The documentation shall include written descriptions and photographs of pre-Project and post-Project pavement conditions. Any pavement or other infrastructure damage caused by the haul trucks shall be repaired/rehabilitated to pre-Project conditions or better. This measure shall be subject to review, approval, and inspection by the County of San Bernardino Department of Public Works and/or Caltrans (for State highway segments).

**Impact TR-2:** The Project could conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures, or other standards established by the county congestion management agency for designated roads or highways (Less than Significant).

According to the “San Bernardino County Congestion Management Program” (SANBAG, 2007), the CMP roadways in the Project area are the State highways, which are SR 18, SR 138, SR 173, and SR 189. The CMP indicates that a traffic study would be required if the Project is expected to generate at least 250 peak hour trips or if the Project would add at least 50 trips to a State highway. The proposed Project would
generate a maximum of 58 vehicle trips during the peak hour for the worst-case scenario, and the Project’s traffic volumes are well below the CMP threshold of 250 trips. As the Project-generated traffic volume of 58 trips would use various travel routes to access the Project site, the Project would add fewer than 50 peak-hour trips to any particular State highway segment. A CMP traffic analysis, therefore, is not required.

The Project would not conflict with an applicable congestion management program or level of service standard established by the congestion management agency. The impacts would be less than significant relative to CMP roads or highways and no mitigation measures would be necessary.

**Impact TR-3:** The Project could substantially increase hazards due to a design feature or incompatible uses (Less than Significant with Mitigation)

The temporary addition of haul trucks to the traffic stream on the roadways that would be used as travel routes for the transport of earthen material from the stockpile and borrow sites to the Project site would result in increased safety risks along the affected roadways, and the presence of large trucks would be incompatible with the residential and local commercial nature of the area. Additionally, the proposed relocation, closure, or partial closure of Lake Drive along the top of the dam and associated detours could potentially result in increased hazards to motorists, bicyclists, and pedestrians. These conflicts would result in safety risks; however, the impacts would be less than significant with the implementation of Mitigation Measures TR-1 through TR-5, which are described under Impact TR-1.

**Mitigation Measures**

- **MM TR-1** Construction Traffic Management Plan
- **MM TR-2** Traffic Control Plan for Lake Drive and Detours
- **MM TR-3** Notification to Property Owners and Tenants
- **MM TR-4** Coordinate with Emergency Service Providers
- **MM TR-5** Pavement Rehabilitation.

**Impact TR-4:** The Project could result in inadequate emergency access (Less than Significant with Mitigation)

The Project could result in a significant impact relative to emergency access because the presence of large trucks along the haul routes and the construction activities within the public right-of-way for the relocation/closure of Lake Drive and associated detours could increase the response times for emergency vehicles (police, fire, and ambulance/paramedic units) and/or block or disrupt access to adjacent properties. The impacts would be significant if the construction and trucking activities would restrict access to or from adjacent land uses with no suitable alternative access. However, these impacts would be avoided by the implementation of Mitigation Measures Mitigation Measures TR-1 through TR-4, which are described under Impact TR-1. With the implementation of these mitigation measures, the Project’s impacts on emergency access would be less than significant.

**Mitigation Measures**

- **MM TR-1** Construction Traffic Management Plan
- **MM TR-2** Traffic Control Plan for Lake Drive and Detours
- **MM TR-3** Notification to Property Owners and Tenants
MM TR-4  Coordinate with Emergency Service Providers

Impact TR-5: The Project could conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities (Less than Significant with Mitigation)

In the event Lake Drive is closed, the Project would disrupt public transit service because the Mountain Transit routes in the Project vicinity which run along Lake Drive west of Lake Gregory Drive and along Lake Gregory Drive south of Lake Drive. Additionally, the detour route roadway segments would experience increased traffic volumes during the detour, which would affect school bus operations. Proposed Mitigation Measure TR-6 requires the Project applicant to coordinate with Mountain Transit and School Districts (which provide bus service along affected detour roadways) prior to construction to develop a plan to maintain or accommodate bus service and access routes.

The Project could potentially block or disrupt the movement of pedestrians and bicycles along the segment of Lake Drive that would temporarily be closed, partially closed, or relocated. However, Mitigation Measure TR-2 (Traffic Control Plan for Lake Drive and Detours), which is described under Impact TR-1, requires a Traffic Control Plan that would provide accommodation for bicyclists and pedestrians at the road relocation/closure. With the implementation of this mitigation measure, the Project’s impacts on alternative transportation would be less than significant.

Mitigation Measure

MM TR-2  Traffic Control Plan for Lake Drive and Detours

MM TR-6  Coordinate with Mountain Transit and School Districts. The Project proponent shall coordinate with Mountain Transit and School Districts (which provide bus service along affected roadways) prior to construction to provide information regarding haul routes, construction schedules, detours, lane closures, etc. and to develop a plan to maintain or accommodate bus service and access routes.

3.13.4 Level of Significance After Mitigation

The implementation of the Mitigation Measures TR-1 through TR-6 would reduce the Project’s traffic and transportation impacts to a less-than-significant level.
3.14 Effects not Found to be Significant

3.14.1 Introduction

In addition to addressing potentially significant environmental effects, CEQA requires that an EIR briefly explain the reasons why certain effects associated with a proposed project have been determined not to be significant, and thus not discussed in detail in the EIR (CEQA Section 21100[c]). Appendix G of the CEQA Guidelines (the Initial Study checklist) contains a list of environmental resources and issues to be evaluated when a Lead Agency conducts preliminary environmental review of a project.

In conducting the preliminary environmental review, the County determined that the proposed Project would have either no impacts or less-than-significant impacts to the following resources and issues:

- Agriculture and Forestry Resources,
- Population and Housing, and
- Mineral Resources,
- Public Services.

Summary descriptions of these resources and issues, and the reasons why the proposed Project would not have significant impacts related to these resources or issues, are provided in the following sections.

3.14.2 Agriculture and Forestry Resources

CEQA Checklist Topics

The proposed Project would not result in potentially significant effects to agricultural resources. Construction and operation of the proposed Project would not:

- Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;
- Conflict with existing zoning for agricultural use, or a Williamson Act contract;
- Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4523), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g));
- Result in the loss of forest land or conversion of forest land to non-forest use; or
- Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forest land to non-forest use.

Explanation

The proposed Project is not located on or near Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Department of Conservation (CDOC, 2010). There are no enrolled Williamson Act lands in the Project area (CDOC, 2013), and the proposed Project would not conflict with a Williamson Act contract. The Project area is zoned as Open Space, Multiple Residential, Rural Living, and Single Residential and is not zoned for agricultural use. The proposed Project is not located on or near lands used for timber harvesting, as mapped by the California Department of Forestry and Fire Protection (CDFFP, 2014). Therefore, the proposed Project would have no effects to agriculture and forestry resources.
3.14.3 Mineral Resources

CEQA Checklist Topics

The proposed Project would not result in potentially significant effects to mineral resources. Construction and operation of the proposed Project would not:

- Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state; or
- Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan.

Explanation

The proposed Project is located in the community of Crestline in an area consisting mainly of recreational and residential land uses. The San Bernardino Mountains are known for historic and ongoing industrial minerals production, including limestone and sand and gravel, as well as locatable minerals such as gold, silver, zinc, tungsten, and lead (USGS, 1993). However, the Project site could not be used for mineral production without the removal of the Lake Gregory Dam and commercial, recreational, and residential buildings in the Project area. The area around the Project site and borrow sites does not have any other known mineral resources, is not within an oil-producing area, and there are no active oil wells known to exist on or near the sites (DOGGR, 1992).

In compliance with the Surface Mining and Reclamation Act (SMARA), the California Geological Survey (CGS) has designated mineral resources in areas within California subject to irreversible land uses that would preclude mineral extraction. Land has been classified by the State Geologist into Mineral Resource Zones ("MRZs") based on geologic and economic factors. The MRZs include classifications for construction materials, industrial and chemical mineral materials, metallic and rare minerals, and non-fluid mineral fuels. The mapping of MRZs is intended to help identify and preserve significant mineral deposits for future use. The MRZs are defined as follows:

- **MRZ-1**: Areas where adequate information indicates that no significant mineral deposits are present, or it is judged that little likelihood exists for their presence;
- **MRZ-2**: Areas where adequate information indicates that significant mineral deposits are present, or where it is judged that a high likelihood exists for their presence;
- **MRZ-3**: Areas containing known or inferred mineral deposits of which the significance is undetermined based on available data; and
- **MRZ-4**: Areas where available information is inadequate for assignment to any other MRZ zone.

The buttress site and the Ponderosa East and Ponderosa West borrow sites are all in an area classified as MRZ-4 and are not located within any known mineral resource zones or locally important mineral resource recovery site (Shumway & Hill, 1995). The type of material to be extracted from the borrow sites can be found throughout the San Bernardino Mountains, and the borrow site locations do not represent any locally important or rare source of aggregate materials. Therefore, the proposed Project would not result in the loss of availability of any known mineral resource that would be of value to the region or the residents of the State, and would not result in the loss of availability of a locally important mineral resource recovery site.
3.14.4 Population and Housing

CEQA Checklist Topics

The proposed Project would not result in potentially significant effects to population and housing. Construction and operation of the proposed Project would not:

- Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses), or indirectly (for example, through extension of roads or other infrastructure);
- Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere; or
- Displace substantial numbers of people necessitating the construction of replacement housing elsewhere.

Explanation

The proposed Project would add structural improvements to the existing Lake Gregory Dam to mitigate safety concerns with an improperly compacted section of the earthen dam. The proposed Project would not construct new homes or new transportation infrastructure, which could directly or indirectly induce population growth. No housing or residents would be displaced, and construction of replacement housing would not be required. No effects to population and housing would occur from the proposed Project.

Construction is expected to occur over a period of up to 12 months, and fewer than 20 workers on average would be required to construct the Project (most of whom are expected to reside in the County). Therefore, construction would be short-term and the proposed Project would not generate a permanent increase in population levels or a decrease in available housing, and no impacts to existing or future population growth levels would occur as a result of construction of the proposed Project.

Periodic routine maintenance and inspections are conducted currently, and will continue to be conducted after construction of proposed dam improvements. These activities would be performed by existing County staff resources or consultants to the County, and would not require additional employment needs. Therefore, the proposed Project would not create a need for new housing and operation of the proposed Project would not generate a direct or indirect increase in the permanent population of the area.

3.14.5 Public Services

CEQA Checklist Topics

The proposed Project would not result in potentially significant effects to public services. Construction and operation of the proposed Project would not:

- Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times, or other performance objectives for any of the public services:
  - Fire protection,
  - Police protection,
  - Schools,
- Parks, and
- Other public facilities.

**Explanation**

The proposed Project does not substantially alter the fire or police response requirements that could occur at the existing site (see Section 3.13 [Traffic and Transportation] for more information on fire and police response). The proposed Project’s construction would not create additional fire risks; see Section 3.7 (Hazards and Hazardous Materials) for more information. The Project would not significantly affect the service ratios, response times, or performance objectives associated with the provision of fire protection and police protection.

The proposed Project would temporarily impact some recreation activities at the adjacent Lake Gregory Regional Park, and the private Camp Switzerland; see Section 3.12 (Recreation and Fisheries) for a full discussion. However, the proposed Project would not introduce the need for new or expanded park facilities because it would not create an increase in the local population.

No schools or other public facilities are located within or are directly adjacent to the proposed Project site, and the construction and operation of the proposed Project would not impact the use, directly or indirectly, of these public facilities. The detour route to be used during periods when Lake Drive is closed at the dam includes San Moritz Way. Mountain High School on San Moritz Way, but this road is already open to the public, and the increase in traffic volume would be temporary and would not substantially affect the use of this school (see Section 3.13 [Traffic and Transportation] for more information). The proposed Project would not substantially increase worker employment in the Project area that would affect the use or adequacy of existing public facilities. Therefore, the proposed Project would not result in substantial adverse impacts to public facilities.
4. Alternatives

The Lake Gregory Dam Rehabilitation Project Alternative 1 (proposed Project) is described in detail in Section 2 (Project Description). This section describes the alternatives to the proposed Project, the alternatives screening process, and the potential environmental effects of alternatives retained for analysis. The intent of this section is to document (1) the range of alternatives that have been selected and evaluated; (2) the approach used by the County in screening the feasibility of these alternatives according to guidelines established under CEQA; (3) the results of the alternatives screening; and (4) the environmental impacts of each alternative relative to the proposed Project. For more information on the alternatives evaluated, refer to Appendix 7 (Alternatives Evaluation – Rehabilitation of Lake Gregory Dam).

This section is organized as follows:

- Section 4.1 summarizes CEQA requirements related to alternatives;
- Section 4.2 describes the process used to define alternatives to the proposed Project;
- Section 4.3 describes the alternatives that were considered, but eliminated from detailed evaluation;
- Section 4.4 describes the alternatives retained for analysis, including the No Project Alternative (CEQA Guidelines §15126.6(e)), and presents impact analysis by topic for each of these alternatives; and
- Section 4.5 presents the Environmentally Superior Alternative (CEQA Guidelines §15126.6(d)).

4.1 CEQA Requirements for Alternatives

An important aspect of EIR preparation is the identification and assessment of reasonable alternatives that have the potential for avoiding or minimizing the impacts of a proposed project. The CEQA Guidelines require consideration of the No Project Alternative (§15126.6(e)) and selection of a reasonable range of alternatives (§15126.6(d)). The EIR must adequately assess these alternatives to allow for a comparative analysis for consideration by decision makers. The CEQA Guidelines (§15126.6(a)) state that:

An EIR shall describe a reasonable range of alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives.

The key applicable provisions of the CEQA Guidelines (§15126.6) pertaining to the analysis of alternatives are summarized as follows:

- The discussion of alternatives shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly.
- The “no project” alternative shall be evaluated along with its impact. The “no project” analysis shall discuss the existing conditions at the time the notice of preparation is published, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services.
- The range of alternatives required in an EIR is governed by a “rule of reason”; therefore, the EIR must evaluate only those alternatives necessary to permit a reasoned choice between the alternatives and
the proposed project. The alternatives shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project.

- For alternative locations, only locations that would avoid or substantially lessen any of the significant effects of the project need be considered for inclusion in the EIR.
- An EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote and speculative.

4.1.1 Consistency with Project Objectives

The CEQA Guidelines require the consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives" (§15126.6(b)). The objective of the proposed Project is to rectify structural inadequacies in the Lake Gregory Dam in accordance with DSOD safety standards in order to mitigate safety concerns and downstream hazards associated with dam failure in the event of a major earthquake.

4.1.2 Feasibility

The CEQA Guidelines (§15364) defines feasibility as:

...capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.

In addition, the CEQA Guidelines §15126.6(f)) states that in determining the range of alternatives to be evaluated in the EIR, the factors that may be taken into account when addressing the feasibility of alternatives are site suitability, economic viability, availability of infrastructure, general plan consistency, other regulatory limitations, jurisdictional boundaries, and proponent’s control over alternative sites. The feasibility of potential alternatives has been assessed taking the following factors into account:

Legal Feasibility: Does the alternative have the potential to avoid lands that have legal protections that may prohibit or substantially limit the feasibility of permitting the Lake Gregory Dam Rehabilitation Project?

Regulatory Feasibility: Does the alternative have the potential to avoid lands that have regulatory restrictions that may substantially limit the feasibility of, or permitting of, the Lake Gregory Dam Rehabilitation Project?

Technical Feasibility: Is the alternative feasible from a technological perspective, considering available technology? Are there any construction, operation, or maintenance constraints that cannot be overcome?

Environmental Feasibility: Would implementation of the alternative cause substantially greater environmental damage than the proposed Project, thereby making the alternative clearly inferior from an environmental standpoint?

This screening analysis does not focus on relative economic factors or costs of the alternatives (as long as they are found to be economically feasible) since CEQA Guidelines require consideration of alternatives capable of eliminating or reducing significant environmental effects even though they may "impede to some degree the attainment of project objectives or would be more costly" (CEQA Guidelines §15126.6(b)). The County of San Bernardino’s proceedings will separately and specifically consider cost issues.
4.1.3 Potential to Eliminate Significant Environmental Effects

CEQA requires that to be fully considered in an EIR, an alternative must have the potential to “avoid or substantially lessen any of the significant effects of the project” (CEQA Guidelines §16126.6(a)). If an alternative was identified that clearly does not provide potential overall environmental advantage as compared to the proposed Project, it was eliminated from further consideration. At the screening stage, it is not possible to evaluate all of the impacts of the alternatives in comparison to the proposed Project with absolute certainty, nor is it possible to quantify impacts. However, it is possible to identify elements of an alternative that are likely to be the sources of impact and to relate them, to the extent possible, to general conditions in the subject area.

4.2 Alternatives Screening and Evaluation Process

In compliance with CEQA’s requirements, each alternative that has been developed for this analysis has been evaluated in three ways:

- Does the alternative accomplish the basic objective of the proposed Project, to rectify structural inadequacies in the Lake Gregory Dam to mitigate safety concerns and downstream hazards associated with dam failure in the event of a major earthquake?
- Is the alternative potentially feasible (from economic, environmental, legal, social, technological standpoints)?
- Does the alternative avoid or substantially lessen any significant effects of the Proposed Project (including consideration of whether the alternative itself could create significant effects potentially greater than those of the Proposed Project)?

Eleven alternatives were initially developed to address the structural deficiencies of the Lake Gregory Dam:

- Downstream stabilization buttress
- Downstream stabilization buttress within dam footprint
- Horizontal drains
- Cement deep soil mixing
- Stone column strengthening
- Plastic concrete cutoff wall
- Soil-bentonite cutoff wall
- Upstream stability buttress
- Upstream concrete face with membrane
- Upstream asphalt face
- New upstream dam

4.3 Alternatives Considered but Eliminated from Further Analysis

This section describes and evaluates the alternatives that did not meet the CEQA criteria defined in Section 4.1. The Lake Gregory Dam Rehabilitation Project’s objective is to rectify structural inadequacies in the dam in accordance with DSOD safety standards in order to mitigate safety concerns from damage to the dam that could result from a large earthquake in the area. Therefore, only engineering alternatives are applicable. The County screened the 11 initial alternatives, and ultimately rejected seven of the potential alternatives based on overly complex construction requirements (potentially infeasible), lower safety factors (unable to meet Project objectives), and cost-prohibitive methods (economically infeasible). DSOD provided input during the alternatives screening process, and alternatives that would not meet DSOD safety standards were also eliminated from further consideration. The following alternatives were considered but eliminated from further analysis:
4. ALTERNATIVES

Downstream stabilization buttress within dam footprint
- Horizontal drains
- Plastic concrete cutoff wall
- Soil-bentonite cutoff wall
- Upstream stability buttress
- Upstream concrete face
- New upstream dam

The Alternatives Evaluation – Rehabilitation of Lake Gregory Dam, Appendix 7, provides details on the alternatives considered but rejected and the alternatives screening process.

4.4 Alternatives Retained for Analysis

This section describes and evaluates the alternatives that meet the CEQA criteria defined in Section 4.1 and thus have been retained for the EIR's alternatives analysis. The No Project Alternative is described and analyzed in Section 4.4.4.

4.4.1 Alternative 2 (Cement Deep Soil Mixing)

Description

Alternative 2 consists of using cement deep soil mixing (CDSM) to strengthen the low density embankment zone (i.e., the area subject to potential liquefaction in a strong earthquake). The CDSM would be on a grid pattern downstream of the embankment centerline. Preliminary analyses indicate that the CDSM zone would need to be 40 feet wide and constructed for the full length of the embankment. The CDSM zone would effectively stiffen the low density zone, reducing liquefaction potential.

Multiple crest and downstream borings and a geophysical investigation would be required prior to construction to better identify the extents of the dam’s low density zone. To install the CDSM columns, installation platforms would be constructed on the downstream (dry) embankment face.

Alternative 2 would include the following:
- Remove trees from downstream (dry) face of dam
- Relocate utilities located in the crest of the dam (if needed)
- Temporarily relocate/widen Lake Drive
- Remove rockfill and common fill down to elevation 4495
- Install CDSM construction platform (includes mechanically stabilized earth wall and temporary fill placement)
- Install CDSM
- Site reclamation

Alternative 2 would not require the Ponderosa West and Ponderosa East borrow sites, as the amount of fill material required would be minimal. However, because this alternative includes boring into the existing dam, it may result in safety considerations during construction. It would also produce approximately 7,500 cubic yards of spoils that would need to be hauled to an appropriate disposal facility. It should be noted that because this alternative does not address upstream seismic instability, additional reinforcements such as a buttress on the downstream slope would likely be required but are unknown at this time without detailed engineering investigation.
Objectives

Alternative 2 would likely meet the Project objective to rectify structural inadequacies in the Lake Gregory Dam in accordance with DSOD safety standards in order to mitigate safety concerns and downstream hazards associated with dam failure in the event of a major earthquake.

Feasibility

This alternative is potentially feasible from economic, environmental, legal, social, and technological standpoints.

Impact Analysis by Issue Area

Aesthetics

Under Alternative 2, the nature of the work at the dam would be similar to the proposed Project and the effects on scenic vistas and visual character of the site would be the same. Alternative 2 as currently identified would not require the borrow sites; therefore, visual impacts at the Ponderosa West and Ponderosa East locations would not occur. However, the proposed borrow site locations are in a remote portion of a private camp and are not visible from any roadways or other access areas by the general public. Alternative 2 would maintain consistency with visual resource goals and policies, the same as the proposed Project. Impacts from light and glare would be the same as the proposed Project. Overall, Alternative 2 would have similar aesthetics impacts as the proposed Project. Mitigation and impact determinations would remain the same as identified for the proposed Project in Section 3.2.

Air Quality and Greenhouse Gas Emissions

Overall, Alternative 2 as currently identified would be expected to have reduced construction requirements in comparison to the proposed Project, which would create a reduction in the air pollutant emissions total from Project construction. However, it is unclear if the maximum daily construction requirements, specifically during the CDSM installation, may have the potential to create higher short-term emissions than estimated for the proposed Project, that could exceed SCAQMD regional or LST thresholds. However, such emissions impacts would likely be able to be mitigated to less than significant by implementation of the proposed Project’s Mitigation Measures AQ-1, AQ-2, and AQ-3; including the likelihood of reducing regional NOx emissions impacts, in comparison to the proposed Project’s significant and unavoidable impacts, to less than significant. In conclusion, from a short-term perspective the air pollutant emissions impacts from this alternative are likely to be lower than or similar to those from the proposed Project, while the long-term air pollutant and greenhouse gas emissions impacts would be reduced. Impact determinations would remain the same as identified for the proposed Project in Section 3.3, with the exception that the regional air quality impacts may be less than significant with mitigation.

Biological Resources

Under Alternative 2, the nature of the work at the dam would be similar to the proposed Project and the effects on special-status species, native vegetation, and jurisdictional areas would be similar. However, overall biological resources impacts would be reduced compared to the proposed Project because Alternative 2 as currently identified would not require the borrow sites; therefore, this alternative would avoid impacts to native vegetation, special-status species, and jurisdictional areas at the Ponderosa Camp. However, if Alternative 2 would require additional reinforcements to address upstream seismic instability, impacts may be similar to those of the proposed Project. Both the proposed Project and Alternative 2 would be consistent with biological resources plans and policies. Neither the proposed Project nor
Alternative 2 would interfere substantially with wildlife movement, although by not utilizing the borrow sites, interference with movement would be further reduced under Alternative 2. Overall, Alternative 2 would have reduced impacts to biological resources but mitigation and impact conclusions would remain the same as identified for the proposed Project in Section 3.4.

**Cultural and Paleontological Resources**

Alternative 2 as currently identified would have the same impacts to cultural and paleontological resources at the dam as the proposed Project, but overall potential for impacts is reduced because there would be no ground disturbance associated with the borrow sites. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.5.

**Geology and Soils**

Alternative 2 may have slightly greater impacts related to loss or injury from seismically induced dam failure during construction. Because Alternative 2 involves boring into the dam itself, the dam’s stability may be compromised during installation of the CDSM. All other geology and soils impacts would be similar to the proposed Project. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.6.

**Hazards and Hazardous Materials**

Impacts from accidental release of hazardous materials at the dam would be the same as the proposed Project, but would be slightly reduced overall for Alternative 2 because no work would occur at the borrow site locations. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.7.

**Hydrology and Water Quality**

Water use would be slightly higher under Alternative 2, as currently identified, compared with the proposed Project at the dam because Alternative 2 would require water for cement mixing. However, this water use may be offset because water would not be required for dust suppression at the borrow sites. The use of cement would also slightly increase the risk that water quality standards could be violated, if cement were to spill and enter nearby waterways. Potential for water quality impacts would be avoided at the Ponderosa Camp because the borrow sites would not be required for Alternative 2. Because Alternative 2 involves boring into the dam itself, the dam’s stability may be compromised during installation of the CDSM, and could result in an increased risk of flood hazards downstream. Overall hydrology and water quality impacts would be similar to the proposed Project, and impact determinations and mitigation would remain the same as described in Section 3.8.

**Land Use**

Impacts to adjacent land uses at the dam would be the same as the proposed Project, but would be slightly reduced overall for Alternative 2 because no work would occur at the borrow site locations. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.9.

**Noise**

Temporary noise and vibration from mobile sources during construction would be significantly decreased when compared to the proposed Project because this alternative as currently identified does not require soil to be trucked from the borrow sites or stockpile location to the dam. While construction activities of
Alternative 2 would also be exempt during the hours of 7:00 a.m. and 7:00 p.m., per Section 83.01.080(g) of the County Development Code, this alternative would not impact residences along the Project material haul routes. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.10.

**Utilities**

Water required for construction would be slightly higher under Alternative 2 compared with the proposed Project at the dam, because Alternative 2 would require water for cement mixing. However, this water use may be offset because water would not be required for dust suppression at the borrow sites. Alternative 2 would also generate more spoils than the proposed Project would, which would need to be disposed of at a landfill with sufficient capacity. Overall utilities impacts would be slightly greater than the proposed Project; however, impact determinations and mitigation would remain the same as described in Section 3.11.

**Recreation and Fisheries**

Impacts to recreation and fisheries at the dam would be the same as the proposed Project, but would be slightly reduced overall for Alternative 2 because no work would occur at the borrow site locations. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.12.

**Traffic and Transportation**

Alternative 2 as currently identified would not require soil to be trucked from stockpile or borrow site locations to the dam. Therefore, daily traffic volumes during construction would be significantly decreased when compared to the proposed Project. While Lake Drive would be closed at the dam during construction, this impact would be the same as described for Option 1 under the proposed Project. Overall traffic flow and roadway disruption impacts would be reduced for Alternative 2 when compared to the proposed Project. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.13.

**Conclusion – Alternative 2**

Alternative 2 as currently identified would not require the volume of fill material that the proposed Project would require, and therefore it would not require hauling material from existing stockpiles, or excavation and hauling of material from borrow sites. Therefore, impacts in several issue areas would be reduced when compared to the proposed Project, including air quality and greenhouse gas emissions, biological resources, cultural and paleontological resources, hazards and hazardous materials, land use, noise, and recreation and fisheries. Traffic and transportation impacts would be substantially reduced in comparison to the proposed Project because Alternative 2 would not involve truck traffic along the haul routes. However, during construction, Alternative 2 may pose a greater risk of dam failure because installation of the CDSM could affect the structural integrity of the dam. Therefore, impacts related to flood hazards would be greater than the proposed Project. If, upon further engineering, Alternative 2 is determined to require a downstream buttress to address upstream seismic instability, then the reduction in several impacts as compared to the proposed Project would not occur and Alternative 2 may have greater environmental impacts overall.
4.4.2 Alternative 3 (Stone Column Strengthening)

Description

Alternative 3 consists of using stone (compacted gravel) columns to strengthen the low density embankment zone. The stone columns would be constructed in rows downstream of the embankment centerline. Preliminary analyses indicate that three rows of stone columns would be required and would be spaced 30 feet apart beginning 10 feet downstream of the centerline. The stone columns would be installed for the full length of the embankment. The columns would effectively stiffen the low density zone, reducing liquefaction potential in addition to providing a conduit to relieve excess pore pressures that would develop in the event of liquefaction.

Multiple crest and downstream borings and a geophysical investigation would be required prior to construction to better identify the extents of the dam’s low density zone. Installation platforms would be constructed on the downstream (dry) embankment face to install the stone columns.

Alternative 3 would include the following:

- Remove trees from downstream (dry) face of dam
- Relocate utilities located in the crest of the dam (if needed)
- Temporarily relocate/widen Lake Drive
- Remove rockfill and common fill down to elevation 4495
- Install stone column construction platform (includes MSE wall and temporary fill placement)
- Install stone columns
- Site reclamation

Alternative 3 would not require fill material to be excavated from the Ponderosa West and Ponderosa East borrow sites. However, because this alternative includes boring into the existing dam, it may result in safety considerations during construction. It would also produce approximately 4,000 cubic yards of spoils that would need to be hauled to an appropriate disposal facility. It should be noted that because this alternative does not address upstream seismic instability, additional reinforcements such as a buttress on the downstream slope would likely be required but are unknown at this time without detailed engineering investigation.

Objectives

Alternative 3 would likely meet the Project objective to rectify structural inadequacies in the Lake Gregory Dam in accordance with DSOD safety standards in order to mitigate safety concerns and downstream hazards associated with dam failure in the event of a major earthquake.

Feasibility

This alternative is potentially feasible from economic, environmental, legal, social, and technological standpoints.
Impact Analysis by Issue Area

**Aesthetics**

Under Alternative 3, the nature of the work at the dam would be similar to the proposed Project and the effects on scenic vistas and visual character of the site would be the same. Alternative 3 as currently identified would not require the borrow sites; therefore, visual impacts at the Ponderosa West and Ponderosa East locations would not occur. However, the proposed borrow site locations are in a remote portion of a private camp and are not visible from any roadways or other access areas by the general public. Alternative 3 would maintain consistency with visual resource goals and policies, the same as the proposed Project. Impacts from light and glare would be the same as the proposed Project. Overall, Alternative 3 would have similar aesthetics impacts as the proposed Project. Mitigation and impact determinations would remain the same as identified for the proposed Project in Section 3.2.

**Air Quality and Greenhouse Gas Emissions**

Overall, Alternative 3 as currently identified would be expected to have reduced construction requirements in comparison to the proposed Project, which would create a reduction in the air pollutant emissions total from Project construction. However, it is unclear if the maximum daily construction requirements, specifically during the stone column installation, may have the potential to create higher short-term emissions than estimated for the proposed Project, that could exceed SCAQMD regional or LST thresholds. However, such emissions impacts would likely be able to be mitigated to less than significant by implementation of the proposed Project’s Mitigation Measures AQ-1, AQ-2, and AQ-3; including the likelihood of reducing regional NOx emissions impacts, in comparison to the proposed Project’s significant and unavoidable impacts, to less than significant. In conclusion, from a short-term perspective the air pollutant emissions impacts from this alternative are likely to be lower than or similar to those from the proposed Project, while the long-term air pollutant and greenhouse gas emissions impacts will be reduced. Impact determinations would remain the same as identified for the proposed Project in Section 3.3, with the exception that the regional air quality impacts may be less than significant with mitigation.

**Biological Resources**

Under Alternative 3, the nature of the work at the dam would be similar to the proposed Project and the effects on special-status species, native vegetation, and jurisdictional areas would be similar. However, overall biological resources impacts would be reduced compared to the proposed Project because Alternative 3 as currently identified would not require the borrow sites; therefore, this alternative would avoid impacts to native vegetation, special-status species, and jurisdictional areas at the Ponderosa Camp. However, if Alternative 3 would require additional reinforcements to address upstream seismic instability, impacts may be similar to those of the proposed Project. Both the proposed Project and Alternative 3 would be consistent with biological resources plans and policies. Neither the proposed Project nor Alternative 3 would interfere substantially with wildlife movement, although by not utilizing the borrow sites, interference with movement would be further reduced under Alternative 3. Overall, Alternative 3 would have reduced impacts to biological resources but mitigation and impact conclusions would remain the same as identified for the proposed Project in Section 3.4.

**Cultural and Paleontological Resources**

Alternative 3 as currently identified would have the same impacts to cultural and paleontological resources at the dam as the proposed Project, but overall potential for impacts is reduced because there
would be no ground disturbance associated with the borrow sites. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.5.

**Geology and Soils**

Alternative 3 may have slightly greater impacts related to loss or injury from seismically induced dam failure during construction. Because Alternative 3 involves boring into the dam itself, the dam’s stability may be compromised during installation of the stone columns. All other geology and soils impacts would be similar to the proposed Project. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.6.

**Hazards and Hazardous Materials**

Impacts from accidental release of hazardous materials at the dam would be the same as the proposed Project, but would be slightly reduced overall for Alternative 3 because no work would occur at the borrow site locations. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.7.

**Hydrology and Water Quality**

Water use would be reduced under Alternative 3 compared with the proposed Project because water would not be required for dust suppression at the borrow sites. Potential for water quality impacts would be avoided at the Ponderosa Camp because the borrow sites would not be required for Alternative 2. Overall hydrology and water quality impacts would be reduced under Alternative 3 compared with the proposed Project; however, impact determinations and mitigation would remain the same as described in Section 3.8.

**Land Use**

Impacts to adjacent land uses at the dam would be the same as the proposed Project, but would be slightly reduced overall for Alternative 3 because no work would occur at the borrow site locations. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.9.

**Noise**

Temporary noise and vibration from mobile sources during construction would be significantly decreased when compared to the proposed Project because this alternative as currently identified does not require soil be trucked from the borrow sites or stockpile location to the dam. While construction activities of Alternative 3 would also be exempt during the hours of 7:00 a.m. and 7:00 p.m., per Section 83.01.080(g) of the County Development Code, this alternative would not impact residences along the Project material haul routes. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.9.

**Utilities**

Water required for construction would be reduced under Alternative 3 compared with the proposed Project, because Alternative 3 would not require water for dust suppression at the borrow sites. However, Alternative 3 would generate more spoils than the proposed Project, which would need to be disposed of at a landfill with sufficient capacity. Overall utilities impact determinations and mitigation would remain the same as described in Section 3.11.
Recreation and Fisheries

Impacts to recreation and fisheries at the dam would be the same as the proposed Project, but would be slightly reduced overall for Alternative 3 because no work would occur at the borrow site locations. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.12.

Traffic and Transportation

Alternative 3 as currently identified would not require soil be trucked from stockpile or borrow site locations to the dam. Therefore, daily traffic volumes during construction would be significantly decreased when compared to the proposed Project. While Lake Drive would be closed at the dam during construction, this impact would be the same as described for Option 3 under the proposed Project. Overall traffic flow and roadway disruption impacts would be reduced for Alternative 3 when compared to the proposed Project. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.13.

Conclusion – Alternative 3

Alternative 3 as currently identified would not require the volume of fill material that the proposed Project would require, and therefore it would not require hauling material from existing stockpiles, or excavation and hauling of material from borrow sites. Therefore, impacts in several issue areas would be reduced when compared to the proposed Project, including air quality and greenhouse gas emissions, biological resources, cultural and paleontological resources, hazards and hazardous materials, land use, noise, and recreation and fisheries. Traffic and transportation impacts would be substantially reduced in comparison to the proposed Project because Alternative 3 would not involve truck traffic along the haul routes. However, during construction, Alternative 3 may pose a greater risk of dam failure because installation of the stone columns could affect the structural integrity of the dam. Therefore, impacts related to flood hazards would be greater than the proposed Project. If, upon further engineering, Alternative 3 is determined to require a downstream buttress to address upstream seismic instability, then the reduction in several impacts as compared to the proposed Project would not occur and Alternative 3 may have greater environmental impacts overall.

4.4.3 Alternative 4 (Upstream Asphalt Facing)

Description

Alternative 4 consists of the construction of an asphalt face on the upstream (lake side) dam slope. The asphalt treatment would provide a firm semi-permeable face to the dam. Asphalt was selected as the facing material because it is flexible enough to move with embankment settling, decreasing the possibility of crack formation and propagation.

This alternative would require complete dewatering of the reservoir to construct. Prior to installation of the asphalt face on the dam, the existing upstream dam slope protection system would need to be removed and a 5-foot wide key at the toe of the slope would be installed into bedrock. Test pits would be dug at the key alignment to properly assess the soil and bedrock strength prior to construction of the concrete key.

Alternative 4 would include the following:

- Completely dewater Lake Gregory
Remove trees from downstream (dry) face of dam
- Completely remove upstream (lake side) riprap
- Construct concrete key into bedrock
- An open graded hydraulic asphalt to act as a leveling asphalt course and also as a drainage layer
- Place hydraulic asphalt as the primary water barrier; this layer would be placed in a single lift from the upstream (lake side) dam toe to the upstream dam crest
- Apply hot mastic coating over the entire new asphalt facing to provide temporary UV and oxidation protection

Alternative 4 would require no downstream (dry side) disturbance other than removal of trees from the dam to comply with DSOD safety standards. It would not require road closure or utility relocation, and it would not require any borrow sites or hauling of material from the existing stockpiles. However, this alternative would require complete dewatering of Lake Gregory. In addition, the asphalt facing may be susceptible to damage in an earthquake.

**Objectives**

Alternative 4 would likely meet the Project objective to rectify structural inadequacies in the Lake Gregory Dam in accordance with DSOD safety standards in order to mitigate safety concerns and downstream hazards associated with dam failure in the event of a major earthquake.

**Feasibility**

This alternative is potentially feasible from economic, environmental, legal, social, and technological standpoints.

**Impact Analysis by Issue Area**

**Aesthetics**

Alternative 4 would have a substantial adverse effect on the aesthetic characteristics of the existing environment. Dewatering Lake Gregory would have a far-reaching impact on the visual character of the area. It would reduce the current scenic vista of the lake to a dry lake bed. It would substantially degrade the surroundings of the Project site and would impact the sensitive receptors of residents and recreation visitors. It would also conflict with the County and Community Plan policies pertaining to visual resources. It would reduce the visual character of the scenic route along Lake Gregory Drive. Furthermore, it would remove a unique environmental feature of Crest Forest. Impacts from Alternative 4 would be significant and could not be mitigated to less-than-significant levels.

**Air Quality and Greenhouse Gas Emissions**

Overall, Alternative 4 would be expected to have substantially reduced construction requirements in comparison to the proposed Project which would generally create a reduction in both the short-term and long-term air pollutant emissions totals from Project construction. These anticipated reductions in emissions make it unclear whether Mitigation Measures AQ-1, AQ-2, and AQ-3 would be required for this alternative. However, an increase in fugitive dust emissions from wind erosion due to lake being drained may require mitigation. Additionally, there is a potential for short-term odor impacts during the lake draining, from the organic decay of lake bed materials, and during asphalt and the hot mastic application (use of which would require SCAQMD rule and regulations compliance review). In conclusion, impacts
from air pollutants are assumed to be reduced in comparison with the proposed Project and would be less than significant or less than significant after mitigation, with the exception of the potentially significant short-term odor impacts when the lake bed is exposed or during the asphalt/mastic application.

**Biological Resources**

Impacts to biological resources of Alternative 4 would be similar to the proposed Project, but dewatering of Lake Gregory would create an additional temporary impact to wildlife and vegetation. There would be no water in the lake during construction and potentially for some time afterward until precipitation and stream flow refill the lake. Lack of water would affect sensitive riparian vegetation growing along the margins of the lake and wildlife that utilize the lake for foraging. However, impacts to biological resources at the borrow site locations would be avoided.

Riparian vegetation along the margins of the lake includes a narrow band of herbaceous riparian vegetation and scattered willow, alder, and cottonwood trees, as well as willow thickets that are found outside of the Project site. During dewatering, the herbaceous riparian vegetation would likely die back, although it may return when the water levels are restored to normal. Riparian trees may also die back, depending on the amount of water available within the root zone. Willows would likely return fairly quickly when water levels are restored. Alders and cottonwoods may have more difficulty recovering and some trees could be lost, especially if the lake requires a prolonged period of time to refill. The riparian trees are mapped as southern cottonwood-willow riparian forest, which is considered a sensitive vegetation community. Temporary loss of a relatively small area of sensitive riparian vegetation would be a potentially adverse, but not significant impact.

Within the lake, habitat would be temporarily lost for common aquatic species, including the several species of fish that have been introduced. Common and special-status wildlife that forage on these aquatic organisms would experience a temporary loss of this resource. Aquatic invertebrates would likely return when water levels are restored. It is assumed that some, but probably not all, fish species currently in the lake would be re-introduced by restocking programs when water levels return to normal.

Bald eagles forage on fish, carrion, and occasionally ducks or other small animals. Bald eagles have been documented at Lake Gregory and are likely to forage there. Dewatering of the lake, with subsequent loss of potential prey, would result in a temporary adverse impact on bald eagles that forage at Lake Gregory. More extensive foraging habitat for bald eagles is available at other nearby lakes in the region, and temporary loss of aquatic species in Lake Gregory would have a potentially adverse, but less than significant impact on bald eagles.

**Cultural and Paleontological Resources**

Alternative 4, Upstream Asphalt Facing, would be more likely to cause impacts to currently unknown cultural or paleontological resources than the proposed Project. Dewatering the reservoir would expose the former valley bottom, an area that is more sensitive for cultural resources than the proposed Project area. The reservoir was inundated prior to the enactment of modern environmental law and, as such, has not been surveyed for cultural resources. A broad, flat valley with a freshwater stream within it is a prime location for Native American use and habitation over the last 12,000 or more years. Additionally, historic period mining, lumbering, residential, or recreational activities that occurred in the area may have left behind traces that would be apparent when the water was removed. While there would be an overall decrease in ground disturbance from this alternative from elimination of the borrow sites, the ground disturbance under Alternative 4 would occur on the reservoir side of the dam and thus would be more likely to encounter unanticipated cultural resources or human burials. With implementation of mitigation
measures CUL-1 and CUL-2, these impacts would likely be reduced to less than significant. However, the dry reservoir bottom would also provide access to the public who may vandalize, collect, or damage exposed cultural resources that could be present, causing a significant adverse indirect impact. These impacts would be permanent even though the risk of these impacts would only exist during the dewatered phase of construction. The mitigation measures included for the proposed Project would not reduce this impact. However, implementation of MM CUL-3 would reduce these impacts to a less than significant level.

The geologic units that underlay the lake are Holocene alluvial sediments that have a Potential Fossil Yield Classification (PFYC) of Class 2 (low sensitivity) for encountering paleontological resources, compared to the PFYC of Class 1 (very low sensitivity) of the Mesozoic plutonic rocks that largely underlie the proposed Project area. While the Holocene alluvial sediments are not highly sensitive for paleontological resources, they are known to occasionally contain resources of scientific value. Thus, construction activities on the reservoir side of the dam are more likely to encounter these resources. With implementation of mitigation measure Paleo-1, impacts to unknown paleontological resources would likely be reduced to less than significant.

**MM CUL-3: Unanticipated Discoveries in Dewatered Areas (Alternative 4 Only).** Any areas of the bottom of Lake Gregory that would be exposed during dewatering of the reservoir must be subjected to pedestrian survey by qualified cultural resources specialists prior to any ground disturbance. Any cultural resources identified during the survey must be inventoried, recorded on California Department of Parks and Recreation 503 forms, and evaluated for their eligibility for listing on the California Register. Additionally, all dewatered areas that contain cultural resources or are deemed sensitive for buried resources shall have restricted access, such as security fencing, when construction personnel are absent to prevent vandalism.

**Geology and Soils**

Alternative 4 may have slightly greater impacts related to loss or injury from seismically induced dam failure during operation, because it is unclear whether this approach would effectively mitigate the structural inadequacies of the dam. All other geology and soils impacts would be similar to the proposed Project. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.6.

**Hazards and Hazardous Materials**

Impacts from accidental release of hazardous materials at the dam would be slightly greater than the proposed Project because of the use of asphalt and mastic, but would be slightly reduced overall for Alternative 4 because no work would occur at the borrow site locations. Impact determinations and mitigation would remain the same as identified for the proposed Project in Section 3.7.

**Hydrology and Water Quality**

Alternative 4 would involve complete draining of the reservoir, which has capacity for approximately 2,100 acre feet of water, and placement of an asphalt facing on the upstream side of the dam. Draining of the reservoir would most likely be to Houston Creek downstream of the reservoir, with potential sedimentation and water quality impacts in Houston Creek from disturbance of bottom sediments in the reservoir. The asphalt lining could be an additional source of polycyclic aromatic hydrocarbons to the lake water (existing sources would include surrounding paved roads).
There would be a temporary alteration of the stream and lake hydrology by draining and filling the lake. Filling of the lake from natural upstream runoff could take approximately one year or more (if drought conditions continue), with corresponding temporary reduction in discharge in the stream bed downstream of the dam. Groundwater use would not be adversely affected by the draining and filling from natural runoff. There would be a temporary reduction in the inflow of water to Lake Silverwood, but as this lake is maintained mainly by State Water Project water, the effect is not expected to be adverse.

Draining of the reservoir would most likely be to Houston Creek downstream of the reservoir, with potential water quality impacts in Houston Creek from disturbance of bottom sediments in the reservoir. The asphalt lining could be an additional source of polycyclic aromatic hydrocarbons to the lake water (existing sources would include surrounding paved roads). Impacts would otherwise be similar to those described in Section 3.8.

The California Water Code portion of the California Porter Cologne Water Quality Control Act would require a report of waste discharge to the Regional Water Quality Control Board, which would impose limitations and restrictions to protect water quality. Alternative 4 water quality impacts would be greater than for the proposed Project, but compliance with existing regulations would ensure this impact would remain less than significant. No mitigation is necessary.

Draining of the reservoir, most likely to Houston Creek downstream of the reservoir, could result in bottom sediments in the reservoir being transferred to Houston Creek. Compliance with the federal Clean Water Act and California Water Code (Porter Cologne Water Quality Control Act) would reduce these impacts to a minimal level. Impacts would otherwise be similar to those described in Section 3.8. Alternative 4 siltation impacts would be greater than for the proposed Project, but compliance with existing regulations would ensure this impact remains less than significant. No mitigation is necessary.

**Land Use**

The land use impacts from Alternative 4 would be similar to the proposed Project, except that temporary disruptions to the residential and recreational land uses surrounding the lake side dam slope would be greater. As discussed in Section 3.9 (Land Use), the potential disruptions to sensitive land uses during construction would include degraded aesthetics, decreased air quality, and increased noise levels and traffic. The same mitigation measures would apply under Alternative 4. In addition, Alternative 4 would require dewatering of Lake Gregory which would create temporary impacts to the existing Lake Gregory Trail that surrounds the lake. These impacts are addressed in the Recreation and Fisheries discussion, below.

Alternative 4 would not conflict with any applicable plans or policies. The Crest Forest Community Plan does state, “...residents acknowledge that Lake Gregory is a community asset that contributes to the character and quality of life in their community and that there is a need to enhance recreation facilities to meet the needs of local residents and limited tourists” (SBC, 2007). However, there are no policies within this Community Plan that the proposed Project would directly conflict with. Although the construction of Alternative 4 would temporarily suspend all activities within Lake Gregory, the intent of the proposed Project and alternatives is to stabilize the Lake Gregory Dam to reduce downstream hazards associated with dam failure. Therefore, the proposed Project and alternatives would protect and ultimately enhance the safety of the surrounding recreation areas.

**Noise**

Because construction activities would only occur on the lake side dam slope, temporary and short-term noise impacts are considered greater at that location when compared to the proposed Project. Temporary
noise and vibration from mobile sources during construction would be significantly decreased when compared to the proposed Project because this alternative does not require soil to be trucked from the borrow sites or stockpile location to the dam, and excavation at the borrow sites would not occur. While construction activities of Alternative 4 would also be exempt during the hours of 7:00 a.m. and 7:00 p.m., per Section 83.01.080(g) of the County Development Code, construction noise would travel across the lake and subject a greater number of hillside residences to temporary construction noise nuisances when compared to construction activities at the dam location under the proposed Project.

Utilities

Water required for construction would be reduced under Alternative 4 compared with the proposed Project, because Alternative 4 would not require water for dust suppression at the borrow sites. Overall utilities impact determinations and mitigation would remain the same as described in Section 3.11.

Recreation and Fisheries

Alternative 4 would require complete dewatering of Lake Gregory which would create substantial, although temporary, adverse impacts to recreational uses within and around the lake. There would be no water in the lake during construction and for some time afterward until precipitation and stream flow refill the lake. Lack of water would preclude existing recreation activities within the lake such as fishing, boating, and swimming. In addition, construction activities on the lake side of the dam would preclude use of the Lake Gregory Trail in the area surrounding construction. The recreation activities within Lake Gregory, particularly fishing, are a major attraction to the community of Crestline. Therefore, the temporary dewatering of the lake would result in significant and unavoidable impacts to the existing recreation activities and the community as a whole.

Traffic and Transportation

Alternative 4 would not require any temporary closures of Lake Drive for either dam construction or relocation of utilities. Daily traffic volumes during construction would be significantly decreased when compared to the proposed Project because this alternative does not require soil to be trucked from stockpile or borrow site locations to the dam. Additionally, the complete dewatering of Lake Gregory during construction of Alternative 4 would also be expected to decrease daily traffic volumes on local roadways from recreationists. While some slowing of traffic on Lake Drive may occur near the work area, overall traffic flow and roadway disruption impacts would be reduced for Alternative 4 when compared to the proposed Project.

Conclusion – Alternative 4

Alternative 4 would not require borrow sites or any work on the downstream face of the dam other than DSOD-required vegetation removal. However, this alternative would require completely dewatering Lake Gregory, and would close Lake Drive temporarily. It would also result in new impacts in air quality (related to odors), and to cultural resources. In comparison to the proposed Project, Alternative 4 would substantially increase the magnitude of aesthetics and recreation and fisheries impacts. Alternative 4 would also increase impacts under several other issue areas, including biological resources, cultural resources, land use, hydrology and water quality, and geology and soils. Although the elimination of the borrow sites would lessen the degree of some impacts such as noise (although noise at the dam location would be greater than the proposed Project) and transportation and traffic, overall Alternative 4 would result in greater environmental impacts than the proposed Project and would require an additional
mitigation measure (MM CUL-3). Alternative 4 would also introduce two significant and unavoidable impacts that would be less than significant under the proposed Project.

4.4.4 Alternative 5 (No Project Alternative)

The requirements for the No Project Alternative analysis are defined under Section 15126.6 (e) of the CEQA Guidelines. Specific requirements relevant to this Project include:

- A No Project Alternative is required to be analyzed by all decision makers to compare approving and not approving the proposed Project. (Section 15126.6 (e)(1)).
- The No Project Alternative shall discuss the existing conditions at the time the notice of preparation is discussed. (Section 15126.6 (e)(2)).
- The discussion would compare the environmental effects of the property remaining in its existing state against the environmental effects that would occur if the Project is approved. The lead agency should proceed to analyze the impacts of the No Project Alternative by projecting what would occur in the reasonable future if the Project would not occur. (Section 15126.6 (e)(3)(B) and (C).

Under the No Project Alternative as defined for this Project, the Lake Gregory Dam would not be rehabilitated. The proposed buttress and associated improvements would not be built. The improperly compacted section of the dam would continue to present the risk of liquefaction and dam failure, and associated downstream hazards. The dam would remain out of compliance with DSOD safety standards, and additional restrictions such as substantially lowering the lake level may be required to minimize pressure on the dam. These restrictions could affect existing uses at Lake Gregory. None of the Project objectives would be achieved.

Although the environmental effects from proposed Project construction described in Section 3 (Environmental Setting, Analysis, and Mitigation Measures) would not occur, the environmental impacts associated with seismically induced dam failure and downstream flooding would be substantially greater for most topics including biological resources, cultural resources, geology and soils, hazards and hazardous materials, hydrology and water quality, land use, and recreation and fisheries. Remedial activities that would be required to repair damage from dam failure and flooding would further increase impacts to these topics and would have impacts under additional topics such as air quality, noise, and traffic and transportation. Therefore, the environmental effects of the No Project Alternative would be greater than the proposed Project.

4.5 Comparison of Alternatives

Table 4-1 presents a comparison of the potential significant impacts of the proposed Project with impacts of the alternatives. Based on the analysis presented in this section and on the impact analysis for the proposed Project presented in Section 3 of this EIR, Alternative 1 (Proposed Project) is the environmentally superior alternative. Alternative 4 (Upstream Asphalt Facing) would introduce new impacts and would substantially increase the magnitude of several impacts as compared to Alternative 1. Alternative 3 (Stone Column Strengthening) and Alternative 2 (Cement Deep Soil Mixing) would avoid impacts at the borrow sites and would therefore reduce the magnitude of impacts for several issue areas including traffic and transportation, air quality and greenhouse gas emissions, biological resources, and others (see Table 4-1). However, both of these alternatives involve boring into the dam structure during installation of the reinforcements, which could undermine the stability of the dam and increase the risk of failure during the construction period. The proposed Project would not affect the structural integrity of the existing dam during construction and would instead strengthen it by constructing a buttress on the downstream face of the existing dam. Consequently,
the dam would remain stable throughout construction and would minimize risk of seismically-induced failure once the buttress is complete. In addition, Alternatives 2 and 3 do not address upstream seismic instability in the existing dam, and if one of these alternatives is selected, a downstream buttress or other reinforcement may be required which would have similar environmental impacts to the proposed Project. Therefore, the maintenance of structural integrity for the existing dam during construction under Alternative 1 (Proposed Project) would outweigh the reduction in magnitude of several environmental effects from Alternatives 2 and 3 (Cement Deep Soil Mixing and Stone Column Strengthening, respectively), and Alternative 1 is therefore the environmentally superior alternative.
Table 4-1. Comparison of Alternatives

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<tr>
<td>Aesthetics</td>
<td>Less than significant with mitigation</td>
<td>Same as proposed Project</td>
<td>Same as proposed Project</td>
<td>Substantially greater than proposed Project</td>
<td>Greater than proposed Project (if dam failure occurs)</td>
</tr>
<tr>
<td>Air Quality and Greenhouse Gas Emissions</td>
<td>Significant and unavoidable regional emissions impacts, all other impacts less than significant or less than significant with mitigation</td>
<td>Less than proposed Project, and all Air Quality impacts may be less than significant with or without mitigation.</td>
<td>Less than proposed Project, and all Air Quality impacts may be less than significant with or without mitigation.</td>
<td>Most impacts slightly less than proposed Project, and all Air Quality impacts other than odor impacts may be less than significant with or without mitigation; impacts from odors greater than proposed Project and potentially significant and unavoidable.</td>
<td>Greater than proposed Project (remedial activities if dam failure occurs)</td>
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<tr>
<td>Biological Resources</td>
<td>Less than significant with mitigation</td>
<td>Less than proposed Project</td>
<td>Less than proposed Project</td>
<td>Greater than proposed Project</td>
<td>Greater than proposed Project (if dam failure occurs)</td>
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<tr>
<td>Cultural and Paleontological Resources</td>
<td>Less than significant with mitigation</td>
<td>Less than proposed Project</td>
<td>Less than proposed Project</td>
<td>Greater than proposed Project</td>
<td>Greater than proposed Project (if dam failure occurs)</td>
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<tr>
<td>Geology and Soils</td>
<td>Less than significant</td>
<td>Slightly greater than proposed Project due to possible compromised stability of the dam during construction</td>
<td>Slightly greater than proposed Project due to possible compromised stability of the dam during construction</td>
<td>Slightly greater than proposed Project (uncertain effectiveness to mitigate seismic instability of dam)</td>
<td>Substantially greater than proposed Project</td>
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<td>Hazards and Hazardous Materials</td>
<td>Less than significant with mitigation</td>
<td>Slightly less than proposed Project</td>
<td>Slightly less than proposed Project</td>
<td>Slightly less than proposed Project</td>
<td>Greater than proposed Project (if dam failure occurs)</td>
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<tr>
<td>Hydrology and Water Quality</td>
<td>Less than significant</td>
<td>Slightly greater than proposed Project due to possible compromised stability of the dam during construction and resultant flood hazard</td>
<td>Slightly greater than proposed Project due to possible compromised stability of the dam during construction and resultant flood hazard</td>
<td>Greater than proposed Project</td>
<td>Substantially greater than proposed Project</td>
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<tr>
<td>Land Use</td>
<td>Less than significant with mitigation</td>
<td>Slightly less than proposed Project</td>
<td>Slightly less than proposed Project</td>
<td>Greater than proposed Project</td>
<td>Greater than proposed Project (if dam failure occurs)</td>
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<tr>
<td>Noise</td>
<td>Less than significant with mitigation</td>
<td>Less than proposed Project</td>
<td>Less than proposed Project</td>
<td>Greater than proposed Project (at the dam); substantially less than proposed Project (at borrow site locations and haul routes)</td>
<td>Greater than proposed Project (remedial activities if dam failure occurs)</td>
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<tr>
<td>Utilities</td>
<td>Less than significant with mitigation</td>
<td>Slightly greater than proposed Project</td>
<td>Similar to proposed Project</td>
<td>Less than proposed Project</td>
<td>Greater than proposed Project (if dam failure occurs)</td>
</tr>
<tr>
<td>Recreation and Fisheries</td>
<td>Significant and unavoidable impacts at swim beach if lake level must be lowered up to 10 feet, all other impacts less than significant with mitigation</td>
<td>Slightly less than proposed Project</td>
<td>Slightly less than proposed Project</td>
<td>Substantially greater than proposed Project</td>
<td>Substantially greater than proposed Project (if dam failure occurs)</td>
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<tr>
<td>Traffic and Transportation</td>
<td>Less than significant with mitigation</td>
<td>Substantially less than proposed Project</td>
<td>Substantially less than proposed Project</td>
<td>Substantially less than proposed Project</td>
<td>Greater than proposed Project (if dam failure occurs)</td>
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5. Cumulative Effects

This section presents the cumulative scenario used to determine the cumulative impacts associated with the proposed Lake Gregory Dam Rehabilitation Project (proposed Project). Cumulative effects are those impacts from related projects that would occur in conjunction with the proposed Project. To document the process used to determine cumulative impacts, this section provides the CEQA requirements, the methodology used in the cumulative assessment, and the projects identified and applicable to the cumulative analysis. The analysis of cumulative impacts is presented by issue area in Section 5.4, below.

5.1 CEQA Requirements

Both CEQA and the CEQA Guidelines require that cumulative impacts be analyzed in an EIR when the resulting impacts are cumulatively considerable, and therefore, potentially significant. The discussion of cumulative impacts must reflect the severity of the impacts, as well as the likelihood of their occurrence; however, the discussion need not be as detailed as the discussion of environmental impacts attributable to the project alone. Further, the discussion is intended to be guided by the standards of practicality and reasonableness. As stated in Public Resources Code Section 21083(b), “a project may have a significant effect on the environment if the possible effects of a project are individually limited but cumulatively considerable.”

According to Section 15355 of the 2014 CEQA Statute and Guidelines:

“Cumulative impacts” refer to two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.

(a) The individual effects may be changes resulting from a single project or a number of separate projects.

(b) The cumulative impact from several projects is the change in the environment which results from the incremental impact of the project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

Further, according to CEQA Guidelines Section 15130 (a)(1):

As defined in Section 15355, a "cumulative impact" consists of an impact which is created as a result of the combination of the project evaluated in the EIR together with other projects causing related impacts. An EIR should not discuss impacts which do not result in part from the project evaluated in the EIR.

In addition, as stated in the CEQA Guidelines, Section 15064(h)(4) it should be noted that:

The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable.

Therefore, the cumulative discussion in an EIR focuses on whether the impacts of the project under review are cumulatively considerable within the context of impacts caused by other past, present, or future
projects. Cumulative impact discussions for each issue area are provided in Section 5.4 (Cumulative Impact Analysis).

5.2 Cumulative Impact Analysis Methodology

The area within which a cumulative effect can occur varies by resource. For example, air quality impacts tend to disperse over a large area, while traffic impacts are typically more localized. For this reason, the geographic scope for the analysis of cumulative impacts must be identified for each resource area.

The analysis of cumulative effects considers a number of variables including geographic (spatial) limits, time (temporal) limits, and the characteristics of the resource being evaluated. The geographic scope of each analysis is based on the topography surrounding the proposed Project and the natural boundaries of the resource affected, rather than jurisdictional boundaries. The geographic scope of cumulative effects will often extend beyond the scope of the direct effects, but not beyond the scope of the indirect effects of the proposed Project. In addition, each project (see Table 5-1), has its own implementation schedule, which may or may not coincide or overlap with the proposed Project’s schedule.

It is noted that cumulative impacts analyzed in this EIR would likely represent a “worst-case” scenario for the following reasons:

- Not all of the related projects will be approved and built. It is also possible that related projects will not be constructed or opened until after the proposed Project has been built;
- Some related projects may be completed prior to the initiation of proposed Project construction; and
- Related projects would likely be, or have been, subject to unspecified mitigation measures, which would reduce potential impacts.

The analysis below focuses on addressing the following: (1) the area(s) in which the effects of the proposed Project would be felt (i.e., the geographic scope); (2) the effects that are expected in the area(s) from the proposed Project; (3) past, present, and reasonably foreseeable future projects that have or that are expected to have impacts in the same area; (4) the impacts or expected impacts from these other projects; (5) and the overall impact(s) that can be expected if the individual impacts are allowed to accumulate.

5.3 Projects Considered in the Cumulative Impact Analysis

For preparation of the cumulative projects list, the County of San Bernardino, Land Use Services Department website (http://cms.sbcounty.gov/lus/Planning/Environmental/Mountain.aspx) was accessed for a current list of projects within a one-mile radius of the proposed Project site (SBC, 2015). Based on this research, the projects within the one-mile radius are described in Table 5-1. Each project is also depicted on Figure 5-1.
Figure 5-1

Cumulative Effect

Lake Gregory Dam Rehabilitation Project

Cumulative Projects

November 2015

Draft EIR
Table 5.1. Lake Gregory Dam Project Cumulative Projects List

<table>
<thead>
<tr>
<th>Project</th>
<th>Type</th>
<th>Location</th>
<th>Status</th>
<th>Map No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lake Gregory Sediment Management and Bioretention Program: Sediment removal, establishment of bioretention storm water basins, and an ongoing maintenance program. Would disturb approximately 4 acres.</td>
<td>Existing Facilities</td>
<td>Lake Gregory, Crestline</td>
<td>IS/MND prepared January 2014 (in implementation)</td>
<td>1</td>
</tr>
<tr>
<td>Lake Gregory Outlet Valve Replacement: Replacement of a valve and associated piping needed to release water from the lake in the event of an emergency.</td>
<td>Water Facilities</td>
<td>Lake Gregory, Crestline</td>
<td>Under construction</td>
<td>2</td>
</tr>
<tr>
<td>TUP: Temporary Use Permit to establish a soil stockpile up to 6,000 cubic yards of dredged material from Lake Gregory Swim Area at Thousand Pines Camp.</td>
<td>Other</td>
<td>Pine Ridge Drive and Weishorn Drive, Crestline</td>
<td>Completed</td>
<td>3</td>
</tr>
<tr>
<td>Verizon Wireless Telecommunications Facility: Conditional use permit for a telecommunications facility with a 95' monopine, equipment shelter, and 12'X18' block building.</td>
<td>Industrial</td>
<td>Village Lane and Crest Forest Drive, Crestline</td>
<td>Unknown</td>
<td>4</td>
</tr>
<tr>
<td>AT &amp; T Mobility Telecommunications Tower: Proposed 55' monopine and one MW dish on a portion of 10.73 acres.</td>
<td>Industrial</td>
<td>Sequoia Lane and Cedar Way, Crestline</td>
<td>IS/MND prepared January 2014</td>
<td>5</td>
</tr>
</tbody>
</table>

5.4 Cumulative Impact Analysis

This section summarizes anticipated cumulative impacts by resource and identifies mitigation measures where appropriate (Public Resources Code Section 21102; CEQA Guidelines Sections 15002 and 15021).

5.4.1 Aesthetics

The geographic scope for aesthetics consists of the Project site and surrounding visual elements. Specifically, it includes the view of the downstream (dry) face of dam covered by rock, vegetation and trees, and the view of the Project site from Lake Gregory Drive, the view from the lake shore bank across the road and the view from surrounding residences which look down towards the site. It also includes the immediate vicinity of the borrow sites at the Ponderosa Camp. The sensitive receptors include campers at Camp Switzerland and the Ponderosa Camp, recreation visitors on Lake Gregory Drive or at Lake Gregory, and nearby residents which face the site. The Lake Gregory Outlet Valve Replacement is a reasonably foreseeable project in the affected area. There are no impacts from this cumulative project that would combine with the proposed Project impacts, and therefore the Project would not contribute to cumulative aesthetics impacts.

5.4.2 Air Quality and Greenhouse Gas Emissions

Air Quality

The air quality impact analysis considers cumulative impacts with respect to the existing ambient air quality conditions. The significance criteria developed by the South Coast Air Quality Management District (SCAQMD) reflect the existing ambient conditions and air quality planning efforts for the air basin, and reflect the SCAQMD’s determination of what constitutes a substantial contribution to existing impacts.
Therefore, the air quality impacts analysis provided in Section 3.3, to a large extent, is a cumulative impacts analysis. The cumulative projects identified above in Table 5-1 are either very small projects that would be assumed to have limited pollutant emissions or would not overlap with the proposed Project. Therefore, cumulative air quality impacts for regional NOx emissions would be significant due to the significant contribution from the proposed Project, and all other air quality cumulative impacts would not be significant.

**Greenhouse Gas Emissions**

Climate change is a global cumulative impact, so the analysis presented in Section 3.3 is a cumulative impact analysis for the proposed Project’s greenhouse gas (GHG) emissions. Therefore, that section serves as the cumulative impacts analysis for greenhouse gas emissions.

### 5.4.3 Biological Resources

The geographic scope of the analysis of cumulative impacts to biological resources includes mid-elevation forested lands that encompass the Project site and vicinity. This area is roughly bounded by Highway 138 on the west, Highway 18 on the south, Highway 173 on the east, and Forest Road 2N37 on the north. This is the area in which cumulative impacts to biological resources are likely to occur.

The Project site is within a mountain community with nearby residential areas and within forested natural habitat that supports native plants and wildlife, including special-status species. See Section 3.4 (Biological Resources) for a detailed description. The Project would potentially result in impacts to native vegetation, including sensitive riparian habitat and special-status plants; impacts to jurisdictional waters and wetlands; and impacts to wildlife, including listed and special-status species. With the implementation of the mitigation measures identified in Section 3.4, the proposed Project’s potential impacts to biological resources would be less than significant.

Lake Gregory is in the community of Crestline within the surrounding San Bernardino National Forest. The majority of the local area has been developed as residential and recreational land uses, and the surrounding landscape is mostly natural open space. Current projects in the affected area are listed in Table 5-1 and are relatively small-scale projects, mainly to maintain or upgrade existing facilities. Future development in the affected area is limited to the private and county-owned lands within the surrounding national forest and is likely to include similar size and types of projects.

Three of the projects listed in Table 5-1 are located at Lake Gregory or the Thousand Pines Camp, where the existing stockpile site and proposed borrow sites would be located. As these projects are occurring geographically and temporally within or near the proposed Project, the impacts may be cumulative with the impacts of proposed Project. These projects and the proposed Project are intended to maintain existing facilities at Lake Gregory and, with mitigation incorporated, their impacts are not anticipated to be cumulatively considerable.

With mitigation incorporated, the proposed Project’s potential impacts to biological resources will be less than significant. Potential impacts of past, present, and reasonably foreseeable projects in the affected area are not anticipated to be cumulatively considerable. Therefore, the Project would not have a considerable contribution to cumulative impacts to biological resources.

### 5.4.4 Cultural and Paleontological Resources

For cultural and paleontological resources, the geographic scope considered for cumulative impacts is the drainage basin for Lake Gregory, consisting of approximately 1700 acres. Within this area four projects
were identified that contribute to cumulative impacts to cultural resources: Lake Gregory Sediment Management and Bioretention Program, Lake Gregory Swim Area Temporary Use Permit, AT & T Mobility Telecommunications Tower, Verizon Wireless Telecommunications Facility. Together these projects would impact roughly 16 acres. Also considered was the amount of development that has occurred in the area, as shown on aerial photographs, and the reservoir itself. An estimated 50 percent of the area has been subjected to development or inundation, which has had a cumulatively significant impact on the cultural resources.

Cultural and paleontological resources are non-renewable. Individually minor but collectively significant actions (usually in the form of ground disturbance) may have a permanent and cumulatively considerable impact on these resources. These impacts may result in a substantially adverse change in the significance of a resource, potentially jeopardizing its eligibility for listing on the California Register.

With the implementation of the mitigation measures, the contribution of the proposed Project to cumulative effects on cultural and paleontological resources would be minimized or avoided. Although these measures would reduce most individual impacts, research and analysis cannot recover all the information value of a resource. Past impacts to cultural resources in the Lake Gregory drainage area have been considerable and adverse. The proposed Project, when combined with impacts from past, present, and reasonably foreseeable projects, contributes in a negligible way to the cumulatively considerable adverse impacts for cultural and paleontological resources in the Lake Gregory drainage area.

5.4.5 Geology and Soils

The geographic scope of the cumulative analysis for geology and soils consists of the Project itself. Geologic materials and soils occur at specific locations and are unaffected by activities not acting on them directly. Consequently, affected resources are as described in Section 3.6.1. Three of the cumulative projects listed in Table 5-1 are at Lake Gregory. These projects involve sediment removal, outlet valve replacement, and soil stockpile. Impacts from these three projects are essentially the same as those described for the Project itself, but would not contribute to cumulative effects because each project would occur on a different site and would therefore affect different soils. Cumulative impacts to geology and soils would not occur.

5.4.6 Hazards and Hazardous Materials

The geographic scope of the cumulative effects analysis for hazards and hazardous materials is limited to the proposed Project site and the routes used by trucks transporting materials to and from the proposed Project site. No significant hazardous materials are expected to be used or disposed of during construction. Therefore, hazards risks resulting from the routine transport, use, or disposal of hazardous materials are not expected. Any potential accidents resulting from a hazardous material spill or leak at the proposed Project site would be localized and not expected to result in a cumulatively considerable impact.

Herbicides may be used for vegetation control, which could result in adverse health effects to the public, maintenance personnel, wildlife, or sensitive vegetation if herbicides are handled improperly or chemical drift occurs away from the Project area. MM HAZ-1 would ensure that herbicide use would not pose a significant hazard to personnel or the environment. Hazards risks resulting from herbicide use at the proposed Project site would be localized and not expected to result in a cumulatively considerable impact.

Grading or excavation at the proposed Project site and borrow sites also has the potential to mobilize hazardous materials currently in the soil, which could result in exposure of personnel and other sensitive receptors such as plants and wildlife to contaminant levels that could result in short-term or long-term

health effects. MM HAZ-2 would reduce potential impacts by requiring the construction contractor to stop work if suspected contamination is identified, cordon off areas of suspected contamination, take appropriate health and safety measures, have a trained individual conduct sampling and testing or suspected material, and, if contamination is found to be greater than regulatory limits, notifying the San Bernardino County Department of Public Health and documenting all actions. Potential exposure to contamination at the proposed Project site would be localized and not expected to result in a cumulatively considerable impact.

There is also the potential for hazardous materials being used at the proposed Project site to be released into washes and streams in the proposed Project area. MMs HAZ-3 and HAZ-4 would require hazardous materials use to occur at a distance from watercourses, which would reduce the potential for any spilled materials to enter watercourses. A potential hazardous material spill or leak at the proposed Project site would be localized, occur at a distance from watercourses, and is not expected to result in a cumulatively considerable impact.

Due to the constructed prevention measures in place, any spillage of oil, diesel fuel, or other hazardous material should not run off the proposed Project site into the surrounding environment. The proposed Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school. Any potential accidents resulting from a hazardous material spill or leak at the proposed Project site would be localized and not expected to result in a cumulatively considerable impact.

During the construction of the proposed Project, heavy construction-related traffic could interfere with emergency response to the site or emergency evacuation procedures in the event of an emergency such as a wildfire. Heavy construction-related traffic could also potentially interfere with emergency response to residences located within one mile of the proposed Project. To ensure emergency access to the site during construction, MM TR-4 requires coordination with emergency service providers. Additionally, MM HAZ-5 would reduce the significance of this impact by ensuring coordination between emergency responders and construction crews and by establishing emergency procedures for access to the proposed Project site in the event of an emergency. Through the implementation of MMs, emergency response is not expected to be affected, and not expected to result in a cumulatively considerable impact.

Potential impacts from the proposed Project would not combine with past, present, and reasonably foreseeable projects (Table 5-1) in the affected area, and the proposed Project’s contribution to cumulative impacts associated with hazards and hazardous materials would not be cumulatively considerable.

5.4.7 Hydrology and Water Quality

The geographic scope of the cumulative analysis for hydrology and water quality includes the Lake Silverwood watershed area. Impacts associated with the proposed Project could combine with other
impacts within the watershed to Lake Silverwood, but any impact associated with this Project would not likely extend beyond that point. The Lake Silverwood watershed is 34 square miles in area and is comprised mainly of the San Bernardino Mountains in the San Bernardino National Forest.

Affected resources include Lake Gregory, Houston Creek downstream of Lake Gregory, the Mojave River downstream of the confluence with Houston Creek and upstream of Lake Silverwood, and Lake Silverwood. New development within these areas is limited mostly to Crestline Village. There are five cumulative projects listed for that area (Table 5-1), three of which are associated with Lake Gregory, and two are telecommunications towers, which would cover very small areas. Past projects would include mainly the community of Crestline Village, and other transportation and Forest Service infrastructure in the area, as well as Lake Silverwood and Lake Gregory themselves.

Cumulative impacts on water quality in Houston Creek and the Mojave River have occurred due to the construction of the community of Crestline Village and other infrastructure, but have not resulted in a State Water Resources Control Board (SWRCB) designation as impaired, indicating these effects are not cumulatively significant. The same is true for sedimentation. Flooding is not a major issue due to the fact that most flood-prone areas are within the National Forest, which has minimal infrastructure to be affected. Further, the Project does not contribute to increased flood potential. Water supply cumulative impacts which would include groundwater use, are significant nearly statewide with the ongoing drought. The relatively small amount of water used in construction of the proposed Project would contribute slightly to this impact, but the impact would be temporary and end after completion of construction. Therefore, the proposed Project would not contribute considerably to any cumulative hydrology or water quality impacts.

5.4.8 Land Use

The geographic scope for the cumulative land use analysis includes the land uses within 0.5 mile of the proposed Project site. Construction of the Lake Gregory Outlet Valve Replacement Project would occur within 0.5 mile of the dam site (should construction timeframes overlap), which would generate temporary disturbances to surrounding land uses that are similar to those described for the proposed Project. The only other project capable of combining with the proposed Project to result in land use impacts is the soil stockpiling of dredged material from Lake Gregory Swim Area at Thousand Pines Camp. However, this project would be complete before construction of the proposed Project would begin; therefore, the proposed Project would not contribute considerably to cumulative land use impacts from construction activities.

Operational land use impacts associated with both the proposed Project and the Lake Gregory Outlet Valve Replacement Project are expected to be minimal. The only impacts would be associated with short-term temporary maintenance activities, similar to current maintenance requirements at these facilities. While these activities could overlap on the same day, any maintenance activities would be minimal, temporary, and would likely occur during daytime weekday hours. Therefore, the proposed Project would not contribute to permanent cumulative land use impacts.

5.4.9 Noise

The geographic scope for this cumulative noise analysis is within approximately 0.5 mile of the dam site, borrow sites, and haul truck routes. This is because noise impacts are localized and would attenuate beyond that distance. The proposed Project would primarily generate noise during construction. Construction of the Lake Gregory Outlet Valve Replacement Project would occur within 0.5 mile of the dam site (should construction timeframes overlap) and is expected to generate similar temporary and
periodic noise as described for the proposed Project. The only other cumulative project capable of combining with proposed Project noise is soil stockpiling of dredged material from Lake Gregory Swim Area at Thousand Pines Christian Camp. However, this project will be complete before construction of the proposed Project would begin. Therefore, the proposed Project would not contribute considerably to cumulative noise impacts.

While some residences could be impacted by short-term noise and vibration disturbances, noise sources associated with construction of the Lake Gregory Outlet Valve Replacement Project would also be exempt from noise and vibration performance standards identified within the San Bernardino County Noise Ordinance, provided such activities do not occur outside of the allowable hours of 7:00 a.m. and 7:00 p.m., per Section 83.01.090(c) of the County Development Code. Because construction of the proposed Project would occur during these allowable times and includes proposed Mitigation Measure NOI-1 to address any noise and vibration complaints during construction, the Project would not contribute to cumulatively considerable temporary noise or vibration impacts.

Operational noise associated with both the proposed Project and the Lake Gregory Outlet Valve Replacement Project would be minimal. The only noise would be associated with short-term temporary maintenance activities, similar to current maintenance requirements at these facilities. While these activities could overlap on the same day, any maintenance noise would be minimal, temporary, and would likely occur during daytime weekday hours. Therefore, the proposed Project would not contribute to cumulatively considerable permanent noise impacts.

5.4.10 Utilities

The proposed Project would generate a minimal volume of wastewater. During construction, wastewater would be contained within portable toilet facilities and disposed of at an approved disposal site. Operation of the proposed Project would not require permanent stationed employees or wastewater treatment facilities. Therefore, the proposed Project would not exceed wastewater treatment requirements, result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, and would not contribute to a cumulatively considerable wastewater impact.

The proposed Project would create a small amount of additional impervious surface. Existing seepage from the dam is minimal, and would be diverted around the work area during construction via a small drainage ditch or channel. Areas of permanent disturbance would be covered with rock or gravel, vegetation, or other stabilizing treatment, which would still allow for water absorption and would lessen stormwater runoff. The proposed Project is designed to accommodate existing and projected stormwater flows and would not require the construction of additional new or expanded stormwater facilities. The proposed Project would not contribute to a cumulatively considerable impact to stormwater facilities.

Sufficient water supplies would be available to serve the proposed Project from existing entitlements and resources, and no new or expanded entitlements would be required. The proposed project would not contribute considerably to a cumulative water supply impact.

Material removed from the dam during preparation, including excessively saturated and organic material, would be hauled out and disposed of at an approved landfill. Existing rock fill slope protection removed from the dam slope would be stockpiled and then reinstalled as slope protection on the buttress following construction. The proposed Project would generate a minimal amount of waste, and there is sufficient capacity in the County of San Bernardino solid waste disposal system to accommodate the solid waste disposal needs of the proposed Project. Therefore, the proposed Project would not contribute considerably to a cumulative landfill impact.
During construction, there is a potential for accidental disruption of other utility systems located in the construction zone. Buried lines are more likely to be accidentally disrupted because their exact locations are sometimes difficult to determine and, therefore, can be unintentionally disrupted by construction activities involving ground disturbance, such as excavation. The County is required by State law to contact Underground Service Alert and manually probe for existing buried utilities in the proposed Project area prior to any powered-equipment drilling or excavation. This would substantially reduce the risk of accidental upset of existing utility lines. In addition, proposed Project construction plans may require the temporary disruption or permanent relocation of buried utility lines located in the construction zone. Therefore, some temporary service interruptions may be unavoidable. While any disruption in service would be temporary in nature, it would inevitably disrupt activities in the surrounding area that are dependent on those utilities. However, MM U-3 would require the public to be notified if there were to be an interruption, thereby allowing the public to prepare for such disruption. Advance warning and preparation would reduce the impact of a sudden disruption in service. With the implementation of MM U-3 and the immediate relocation of potentially affected utility lines, the proposed Project would not contribute considerably to cumulative impacts to utilities.

5.4.11 Recreation and Fisheries

The geographic scope for the cumulative recreation impacts analysis includes recreational resources within 0.5 mile of the Project sites. This is an appropriate study area for recreation and fisheries because it captures all major recreation resources that contribute to baseline conditions and could potentially be affected by activities related to the Project. Construction of the Lake Gregory Outlet Valve Replacement Project would occur within 0.5 mile of the dam site (should construction timeframes overlap), which would generate temporary disturbances to surrounding recreational areas that are similar to those described for the proposed Project. However, both of these projects would occur while Camp Switzerland is closed and no cumulative impacts to recreation at the campground would occur. The only other project capable of combining with the proposed Project to result in impacts to recreational resources is the soil stockpiling of dredged material from Lake Gregory Swim Area at Thousand Pines Camp. However, this project will be complete prior to the initiation of Project construction; therefore, the proposed Project would not contribute considerably to cumulative recreation impacts during construction activities.

Operational impacts to recreation areas and fisheries associated with both the proposed Project and the Lake Gregory Outlet Valve Replacement Project would be minimal. The only impacts would be associated with short-term temporary maintenance activities, similar to current maintenance requirements at these facilities. While these activities could overlap on the same day, any maintenance activities would be minimal, temporary, and would likely occur during daylight weekday hours. Therefore, the proposed Project would not contribute to permanent cumulative recreation impacts.

5.4.12 Traffic and Transportation

The geographic scope for this cumulative traffic analysis includes study area roadways that may share traffic from cumulative projects: Lake Drive, Lake Gregory Drive, San Moritz Drive, Pine Ridge, Weisshorn Drive, Wabern Drive, Wylerhorn Drive, Zurich Drive, and Gregory Place. The only cumulative projects generating traffic volumes that could combine with proposed Project trips are the Lake Gregory Sediment Management and Bioretention Program and the Lake Gregory Outlet Valve Replacement Project. The cumulative project that would generate the most trips is soil stockpiling of dredged material from Lake Gregory Swim Area at Thousand Pines Camp. However, this project would be complete prior to the initiation of proposed Project construction. Therefore, the proposed Project would not contribute considerably to cumulative traffic impacts.
Due to the limited activities of the Lake Gregory Outlet Valve Replacement Project, temporary construction activities are expected to generate less than 10 daily trips. Based on a review of the Lake Gregory Sediment Management and Bioretention Program Initial Study, a maximum of 100 daily trips would occur during temporary sediment transport. Should these trips cumulatively combine with the Project, the addition of these cumulative traffic volumes to the peak hour and daily traffic volumes that would be generated by the Project (refer to Table 3.13-3), this cumulative temporary increase in daily traffic would be minor as compared to the roadway capacities and existing traffic volumes on the study area roadway network (refer to Table 3.13-2). Therefore, while cumulative projects identified in Table 5-1 may cumulatively increase traffic volumes in the study area if activities overlap with proposed Project construction, most are temporary construction-related traffic and would have a less than significant impact relative to roadway levels of service.

The proposed Project would cause roadway damage and temporary disruption to traffic, pedestrian, and bicycle circulation associated with the temporary relocation or closure of Lake Drive along the top of the Lake Gregory Dam. However, the only cumulative project that could combine with these temporary impacts is the Lake Gregory Outlet Valve Replacement Project. Because this project is located within the portion of Lake Drive disrupted by the proposed Project, no additional disruption would cumulatively occur. With the implementation of proposed Mitigation Measures TR-1 through TR-5, the Project would not contribute considerably to cumulative roadway damage and disruption impacts.
6. Other CEQA Considerations

Section 15126 of the California Environmental Quality Act (CEQA) Guidelines requires that all aspects of a project must be considered when evaluating its impact on the environment. As part of this analysis, the Environmental Impact Report (EIR) must also identify: (1) significant environmental effects of a proposed project; (2) significant environmental effects that cannot be avoided if a proposed project is implemented; (3) significant irreversible environmental changes that would result from implementation of a proposed project; (4) growth-inducing impacts of a proposed project; (5) mitigation measures proposed to minimize significant effects; and (6) alternatives to a proposed project.

Table ES-1 (Summary of Environmental Impacts and Mitigation Measures) in the EIR Executive Summary and Sections 3.2 through 3.13 identify the significant environmental effects of the proposed Project, and feasible mitigation measures to reduce the magnitude of impacts. Alternatives to the proposed Project are described and analyzed in Section 4. The following addresses growth-inducing effects (Section 6.1), significant irreversible environmental changes (Section 6.2), and significant effects that cannot be avoided (Section 6.3).

6.1 Growth-Inducing Effects

Background

In accordance with Section 15126.2(d) of the CEQA Guidelines, an EIR must “discuss the ways in which the proposed project could foster economic or population growth, or the construction of additional housing, either directly or indirectly, in the surrounding environment.” In addition, when discussing growth-inducing impacts of a proposed project, “it must not be assumed that growth in any area is necessarily beneficial, detrimental, or of little significance to the environment” (Section 15126.2(d) of the CEQA Guidelines). Two issues must be considered when assessing the growth-inducing impacts of a project:

- **Elimination of Obstacles to Population Growth.** The extent to which additional infrastructure capacity or a change in regulatory structure would allow additional development in the County and region.

- **Promotion of Economic Growth.** The extent to which a project can cause increased activity in the local or regional economy. Economic impacts can include direct effects, such as the direction and strategies implemented within the area of a project, and indirect or secondary impacts, such as increased commercial activity needed to serve the population growth forecasts for the project area.

**Elimination of Obstacles to Population Growth**

The elimination of either physical or regulatory obstacles to population growth is considered to be a growth-inducing impact. A physical obstacle to population growth typically involves the lack of public service infrastructure. The extension of public service infrastructure, including roadways, water mains, and sewer lines, into areas that currently do not have these services is expected to support new development. However, the proposed Project would not remove any obstacle to growth as it does not include the extension of any public service infrastructures.

**Promotion of Economic Growth**

The proposed Project would result in direct economic impacts to the County through employment and the local purchase of some construction materials, as well as secondary impacts from the purchases of goods and services by those employed to construct the proposed Project. However, the proposed Project would not directly or indirectly promote sufficient economic growth to result in a population that would
exceed the projections of the Southern California Association of Governments. Fewer than 20 workers on average would be required to construct the Project (most of whom are expected to reside in the County), and construction would be completed within a 12-month period. Maintenance of the dam after completion of the proposed Project would be performed by County operation and maintenance employees and would not require additional staffing.

6.2 Significant Irreversible Environmental Changes

Section 15126.2(c) of the CEQA Guidelines requires a discussion of any significant irreversible environmental changes that would be caused by the Project. Specifically, Section 15126.2(c) states:

Uses of nonrenewable resources during the initial and continued phases of the project may be irreversible, since a large commitment of such resources makes removal or nonuse thereafter unlikely. Primary impacts and, particularly, secondary impacts (such as highway improvement which provides access to a previously inaccessible area) generally commit future generations to similar uses. Also, irreversible damage can result from environmental accidents associated with the project. Irretrievable commitments of resources should be evaluated to assure that such current consumption is justified.

Generally, a project would result in significant irreversible environmental changes if:

- The primary and secondary impacts would generally commit future generations to similar uses
- The project would involve a large commitment of nonrenewable resources
- The proposed consumption of resources is not justified (e.g., the project involves the wasteful use of energy)
- The project involves uses in which irreversible damage could result from any potential environmental accidents associated with the project

Implementation of the proposed Project would commit nonrenewable energy resources during construction. This includes the use of fossil fuels and energy required for the buttress construction and associated activities, including earthen material excavation from up to two borrow sites. Once completed, operation and maintenance activities would be limited to periodic inspections, vegetation control on the face of the buttress, debris and trash removal, and erosion and slope repair as needed. Therefore, an irreversible commitment of very small amounts of nonrenewable energy resources would occur.

Implementation of the proposed Project would not result in any significant and unavoidable impacts related to any other nonrenewable environmental resources, or otherwise consume water, electricity, and fossil fuels in an unnecessary, inefficient, or wasteful manner. Irreversible impacts associated with the proposed Project would be less than significant.

6.3 Significant Effects that Cannot be Avoided

Section 15126.2(b) of the CEQA Guidelines specifies that an EIR describe any significant impacts that cannot be avoided, even with the implementation of feasible mitigation measures. Implementation of the proposed Project would result in two significant and unavoidable impacts. Project air quality impacts; specifically, worst-case daily NOx emissions, would be above the SCAQMD Regional Significance Threshold for NOx. Mitigation Measures AQ-1, AQ-2, and AQ-3 would reduce emissions by requiring fugitive dust control measures and emissions control for both on- and off-road construction equipment. While these measures would reduce most air quality impacts to less than significant, NOx emissions would remain
above the SCAQMD threshold and no additional feasible mitigation is available to further reduce emissions during the temporary construction period.

As stated in Section 2 (Project Description), the proposed Project would first seek to avoid lowering Lake Gregory water levels during construction. Provided construction does not require lowering the water level, fishing and recreational water/beach use would not be affected. However, in the event the California Department of Water Resources, Division of Safety of Dams (DSOD) requires lowering the lake level up to 10 feet during construction of the Project, impacts to recreation activities at the Lake Gregory Regional Recreation Area would be significant and unavoidable. There is no feasible mitigation to reduce this impact.

All other significant Project impacts can be mitigated to a less-than-significant level.
7. References

General (Introduction, Project Description, Other CEQA Considerations)


___ 2012b. Stability Investigation Lake Gregory Dam, Dam ID 1803-003, County of San Bernardino, California. Prepared for County of San Bernardino Special Districts Department, 157 W. Fifth Street, Second Floor, San Bernardino, Ca. Tetra Tech, 1900 S. Sunset Street, Ste. 1-F, Longmont, Colorado 80501.


Section 3 – Environmental Setting, Analysis, and Mitigation Measures

Section 3.1 – Introduction to Environmental Analysis

No references.

Section 3.2 – Aesthetics

No references.
Section 3.3 – Air Quality and Climate Change


REFERENCES

Section 3.4 – Biological Resources


CDFW (California Department of Fish and Wildlife). 2015a. California Natural Diversity Database (CNDDB) RareFind, version 3.1.1.

Caltrans (California Department of Transportation) and CDFW (California Department of Fish and Wildlife). 2010. California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California. [Online]: http://www.dfg.ca.gov/habcon/connectivity/


County of San Bernardino Special Districts Department. 2013. Notice of Preparation of a Draft Environmental Impact Report for Lake Gregory Dam Rehabilitation Project.


Gonzales (Gonzales Environmental Consulting). 2013. Habitat Assessment and Focused Surveys for Southwestern Willow Flycatcher, Silt Removal Lake Gregory.


Lake Gregory Dam Rehabilitation Project

7. REFERENCES


Section 3.5 – Cultural and Paleontological Resources


Section 3.6 – Geology and Soils


Section 3.7 – Hazards and Hazardous Materials


Section 3.8 – Hydrology and Water Quality


Section 3.9 – Land Use


Section 3.10 – Noise


Section 3.11 – Utilities

No references.

Section 3.12 – Recreation and Fisheries


Section 3.13 – Traffic and Transportation


Section 3.14 – Effects not Found to be Significant


Section 4 – Alternatives


Section 5 – Cumulative Effects


Section 6 – Other CEQA Considerations

No references.
8. Glossary, Acronyms, and Abbreviations

8.1 Glossary

100 Year Flood – A stream flow caused by a discharge that is exceeded, on the average, only once in 100 years. A 100 year flood has a 1 percent chance of occurrence in any given year.

A-weighting – A frequency measure of noise, which simulates human perception.

Acre-foot – A unit of measure for water demand and supply. The volume of 1 acre-foot would cover 1 acre to a depth of 1 foot and is equal to 325,851 gallons.

Air quality standard – The specified average concentration of an air pollutant in ambient air during a specified time period, at or above which level the public health may be at risk; equivalent to AAQS.

Ambient air – Any unconfined portion of the atmosphere; the outside air.

Ambient noise level – Noise from all sources, near and far. The ambient noise level constitutes the normal or existing level of environmental noise at a given location.

Baseline – A set of existing conditions against which change is to be described and measured.

Carbon monoxide (CO) – A colorless, odorless, toxic gas produced by incomplete combustion of carbon in fossil fuels.

Cultural resource – Places or objects important for scientific, historical, and religious reasons to cultures, communities, and individuals.

Cumulative impact – Two or more individual impacts that, when considered together, are considerable or that compound or increase other environmental impacts.

dBA – The A-weighted decibel scale representing the relative insensitivity of the human ear to low-pitched sounds; decibels (dB) are logarithmic units that compare the wide range of sound intensives to which the human ear is sensitive.

Emission – Unwanted substances released by human activity into air or water.

Emission limit – A regulatory standard that restricts the discharge of an air pollutant into atmosphere.

Environmental Impact Report (EIR) – An environmental impact assessment document prepared in accordance with the California Environmental Quality Act (CEQA).

Environment – The physical conditions that exist in the area and that would be affected by a proposed project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance. The area involved is where significant direct or indirect impacts would occur as a result of the project. The environment includes both natural and artificial conditions.

Fugitive Dust – Airborne soil particles.

Groundwater – Water formed underground in soil pore spaces and in the fractures of rock formations. It is stored in and moves slowly through geologic formations of soil, sand, and rocks called aquifers.

Impact – The effect of the project that would occur absent mitigation measures. Direct impacts are those that are caused by and immediately related to the proposed project. Indirect impacts would occur...
later in time or farther removed in distance, but are still reasonably foreseeable effects of the proposed project.

**Invertebrate** – Animals that lack a spinal column.

**Leq** – Energy-equivalent sound level; average level of sound determined over a specific period of time.

**Lead Agency** – The agency responsible for preparation of the CEQA document. For the proposed Lake Gregory Dam Rehabilitation Project, the County of San Bernardino is the Lead Agency under CEQA.

**Less than significant impact** – An impact that is adverse but that does not exceed the defined thresholds of significance. Less than significant impacts do not require mitigation.

**Level of service** – A measure of roadway congestion, ranging from A (free-flowing) to F (highly congested).

**Liquefaction** – The process of making or becoming liquid (soils).

**Mitigation** – Measures that avoid or substantially reduce the proposed project’s significant environmental impacts by avoiding or minimizing the degree of impact, or rectifying or compensating for the impact after it occurs.

**Nitrogen dioxide (NO₂)** – A molecule of one nitrogen and two oxygen atoms. Results usually from further oxidation of nitric oxide (NO) in the atmosphere. Ozone accelerates the conversion.

**Ozone (O₃)** – A molecule of three oxygen atoms. Ozone is a colorless gas formed by a complex series of chemical and photochemical reaction of reactive organic gases, principally hydrocarbons, with the oxides of nitrogen, which is harmful to the public health, the biota, and some materials.

**Oxides of nitrogen (NOx)** – Poisonous and highly reactive gases produced when fuel is burned at high temperatures, causing nitrogen in the air to combine with oxygen.

**Paleontological resource** – Fossilized remains of ancient plants and animals and the traces thereof (e.g., track ways, imprints, burrows, etc.).

**Particulate matter (particulates)** – Very fine sized solid matter or droplets, typically averaging one micron or smaller in diameter. Also called “aerosol.”

**ppm** – Parts per million, a measure of the amount of one substance found in a second, which is the carrier.

**Project** – The whole of an action that has the potential for resulting in a physical change in the environment, directly or ultimately.

**Riparian** – Of or relating to wetlands adjacent to rivers and streams.

**Sensitive receptor** – Land uses adjacent to or within proximity to the proposed project that could be impacted by construction, operation, and maintenance activities.

**Significant impact** – A substantial, or potentially substantial, adverse change in any of the physical conditions in the area affected by the proposed project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historical or aesthetic significance.
Significant and unavoidable impact – An impact that exceeds the defined thresholds of significance and cannot be eliminated or reduced to a less than significant level through the implementation of mitigation measures.

Siltation – The increased concentration of suspended sediments, and the increased accumulation of fine sediments on the bottoms of water bodies where they are undesirable.

State Implementation Plan (SIP) – A document required periodically from each county by EPA that indicates the progress and the planning of the South Coast Air Quality Management District for improving the quality of its air.

Species – A taxonomic entity that can include recognized subspecies, varieties, population segments, or other genetically or geographically distinct units.

Stormwater runoff – Runoff from rain and snowmelt that flows over land or impervious surfaces and does not percolate into the ground. It accumulates debris, chemicals, sediment, or other pollutants that could adversely affect water quality.

Sulfur oxide (SOx) – The group of compounds formed during combustion or thereafter in the atmosphere of sulfur compounds in the fuel, each having various levels of oxidation, ranging from two oxygen atoms for each sulfur atom to four oxygen atoms.

Sulfur dioxide (SO2) – A corrosive and poisonous gas produced from the complete combustion of sulfur in fuels.

Sulfur oxides – A gaseous mixture of sulfur dioxide (SO2) and sulfur trioxide (SO3) and symbolically represented as SOx. Can include particulate species such as sulfate compounds (SO4).

Thresholds of significance – Resource-specific thresholds, where appropriate, are used to evaluate the significance of environmental impacts. They are based on available resource agency thresholds, such as the South Coast Air Quality Management District’s air pollutant and greenhouse gases emissions thresholds, augmented where appropriate with those identified in the Initial Study Checklist included in Appendix G of the CEQA Guidelines, and modified as needed to address potential Project impacts.

Visual sensitivity – Consideration of people’s uses of various environments and their concerns for maintenance of scenic quality and open-space values; examples of areas of high visual sensitivity would be areas visible from scenic highways, wilderness areas, parks, recreational water bodies, etc.

Volatile organic compounds (VOCs) – Gas emissions from certain solids or liquids (e.g., paint, pesticides, building materials). VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects.

Watershed – The area contained within a drainage divide above a specified point on a stream.

Wetland – Lands transitional between obviously upland and aquatic environments. Wetlands are generally highly productive environments with abundant fish, wildlife, aesthetic, and natural resource values. For this reason, coupled with the alarming rate of their destruction, they are considered valuable resources, and several regulations and laws have been implemented to protect them.
### 8.2 Acronyms and Abbreviations

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<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<td>BLM</td>
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<td>Best Management Practices</td>
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<td>Before present</td>
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<td>Clean Air Act</td>
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<td>CCC</td>
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<td>California Department of Fish and Wildlife</td>
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<td>Community Wildfire Protection Plans</td>
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<td>Department of Toxic Substances Control</td>
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<td>WPA</td>
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9. **EIR Preparers and Reviewers**

In accordance with State CEQA Guidelines Section 15036(d)(6), Table 9-1 provides a listing of the persons who prepared this EIR. Table 9-2 provides a listing of those persons who participated in its review.

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<thead>
<tr>
<th>Company Affiliation and Name</th>
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<tr>
<td><strong>Aspen Environmental Group</strong></td>
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<td>Jon Davidson</td>
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<td>Deputy Project Manager, Executive Summary, Introduction, Project Description, Introduction to Environmental Analysis, Effects not Found to be Significant, Alternatives, Cumulative Effects, Other CEQA Considerations; EIR Preparers and Reviewers</td>
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<td>Analyst – Cumulative Effects</td>
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<td>Cultural Resources Assessment – Cultural Resources, Geographic Information Systems, Native American Consultation, Field Work</td>
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<td>Lynn Furnis</td>
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<td>Ian Scharlotta</td>
<td>Cultural Resources Assessment – Report Author</td>
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<tr>
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<tr>
<td>Kim Scott</td>
<td>Paleontological Technical Memorandum – Report Preparation</td>
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<tr>
<td>André Simmons</td>
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Table 9-1. EIR Preparers and Contributors

<table>
<thead>
<tr>
<th>Company Affiliation and Name</th>
<th>Role</th>
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<tbody>
<tr>
<td>Geotechnical Consultants</td>
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<td>Jim Thurber</td>
<td>Senior Analyst – Geology and Soils, Groundwater</td>
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<td>Aurie Patterson</td>
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<tr>
<td>Richard Garland</td>
<td>Senior Analyst – Traffic and Transportation</td>
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Table 9-2. EIR Reviewers

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<tr>
<th>Name</th>
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<tr>
<td>Tim Millington</td>
<td>County of San Bernardino, Special Districts Dept</td>
<td>Interim Division Manager</td>
</tr>
<tr>
<td>David Gettel</td>
<td>Griffin Structures Inc.</td>
<td>Project Manager</td>
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</table>

Organizations Consulted

The EIR Preparers reviewed agency websites for data and regulatory information in preparation of this EIR. The agency websites are listed in their respective technical chapter in Section 7 (References). A list of the agency websites that were consulted are presented below.

- California Air Pollution Control Officers Association
- California Air Resources Board
- California Department of Conservation
- California Department of Fish and Wildlife
- California Department of Forestry and Fire Prevention
- California Department of Motor Vehicles
- California Department of Toxic Substances Control
- California Department of Transportation
- California Department of Water Resources
- California Division of Oil, Gas, and Geothermal Resources
- California Geological Survey
- California Natural Resources Agency
- California Office of the Attorney General
- Crestline Village Water District
- Federal Emergency Management Agency
- Federal Highway Administration
- Federal Transit Authority
- Governor’s Office of Planning and Research
- Lahontan Regional Water Quality Control Board
- Mojave Water Agency
- Natural Resource Conservation Service
- San Bernardino Associated Governments
- San Bernardino County
- South Coast Air Quality Management District
- State Water Resources Control Board
- United States Geological Survey
- United States Environmental Protection Agency
In addition to the websites that were consulted, the consultant team contacted the following agencies directly to obtain information for the cultural and paleontological resources section.

- San Bernardino County Archaeological Information Center
- South Central Coastal Information Center
- Big Bear Valley Historical Society
- Rim of the World Historical Society
- Native American Heritage Commission
- Gabrieleno/Tongva Nation
  - Sam Dunlap, Cultural Resource Director
  - Sandonne Goad, Chairperson
- Gabrieleno/Tongva San Gabriel Band of Mission Indians
  - Anthony Morales, Chairperson
- Gabrieleno Band of Mission Indians – Kizh Nation
  - Andrew Salas, Chairperson
- Morongo Band of Mission Indians
  - Robert Martin, Chairperson
  - Ernst Siva, Tribal Elder
  - Denisa Torres, Cultural Resources Manager
- San Manuel Band of Mission Indians
  - Lynn Valbuena, Chairwoman
  - Daniel McCarthy, Director, CRM Department
- San Fernando Band of Mission Indians
  - John Valenzuela, Chairperson
- Serrano Nation of Mission Indians
  - Goldie Walker, Chairwoman
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