3.10 HYDROLOGY AND WATER QUALITY

This section includes a discussion of existing hydrologic conditions, a summary of applicable hydrology and water quality regulations, and an analysis of potential short-term and long-term hydrologic or water quality impacts that could result from implementation of the Tahoe City Cross-Country Lodge Replacement and Expansion Project. The primary topics raised during scoping that pertain to hydrology and water quality included:

- Potential for changes in runoff volume;
- Effects to floodplains and wetlands; and
- Potential effects on water quality.

Mitigation measures are recommended for any significant or potentially significant impacts to important natural hydrologic processes or conditions, or to water quality. A discussion of effects related to land coverage and potential erosion, and potential effects of a seismically induced seiche or tsunami are provided in Section 3.9, "Geology, Soils, Land Capability, and Coverage." A discussion of effects to stream environment zone (SEZ) habitat is found in Section 3.3, "Biological Resources," and is also discussed below in relation to water quality. Information sources used in the preparation of this analysis include previous studies conducted for the watersheds within the vicinity of the proposed Project and Alternative A sites, environmental impact reports and background reports prepared for plans and projects in the vicinity, and published and unpublished hydrologic literature.

The proposed Project site and Alternative A site do not contain stream or water bodies and are not in the 100-year flood hazard zone for any stream or water body. Therefore, issues related to water currents, stream volumes, or flood hazards are not evaluated further.

Changing the pattern of ownership of parcels as part of the larger land exchange being contemplated by TCPUD and the Conservancy by itself would have no impact on hydrology and water quality. The potential environmental effects from construction and operation of the proposed Project on a portion of APN 093-160-064, currently owned by the Conservancy, are assessed in this section and other resource sections in Chapter 3, "Environmental Setting, Environmental Impacts, and Mitigation Measures," and in Chapter 5, "Other CEQA-Mandated Sections," of this EIR. The purpose of the land exchange is to consolidate ownership and increase land management efficiencies for the agencies and no other physical changes are proposed for the affected parcels.

3.10.1 Regulatory Setting

FEDERAL

Clean Water Act (Public Law 92-500)

Section 404

The Clean Water Act (CWA) consists of the Federal Water Pollution Control Act of 1972 and subsequent amendments. The CWA provides for the restoration and maintenance of the physical, chemical, and biological integrity of the nation's waters. Section 404 of the act prohibits the discharge of fill material into waters of the United States, including wetlands, except as permitted under separate regulations by the U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (EPA). To discharge dredged or fill material into waters of the United States, including wetlands, Section 404 requires projects to receive authorization from the Secretary of the Army, acting through the USACE. Waters of the U.S. are generally defined as "…waters which are currently used, or were used in the past, or may be susceptible to use in interstate or foreign commerce, including all waters which are subject to the ebb and flow of the tide; territorial seas and tributaries to such waters."

Section 401

Under CWA Section 401, applicants for a federal license or permit to conduct activities that may result in the discharge of a pollutant into waters of the United States must obtain certification for the discharge. The certification must be obtained from the state in which the discharge would originate or, if appropriate, from the interstate water pollution control agency with jurisdiction over the affected waters at the point where the discharge would originate. Therefore, all projects that have a federal component and may affect state water quality (including projects that require federal agency approval, such as issuance of a Section 404 permit) must also comply with CWA Section 401. Water quality certification requires evaluation of potential impacts in light of water quality standards and CWA Section 404 criteria governing discharge of dredged and fill materials into waters of the United States. The federal government delegates water pollution control authority under CWA Section 401 to the states (and in California, ultimately to the Regional Water Quality Control Boards).

Section 402

Section 402 of the CWA establishes the National Pollutant Discharge Elimination System (NPDES) permit program to regulate discharges of pollutants into waters of the United States. A NPDES permit sets specific discharge limits for point sources discharging pollutants into waters of the United States and establishes monitoring and reporting requirements, as well as special conditions. Two types of nonpoint source discharges are controlled by the NPDES program: discharges caused by general construction activities, and the general quality of stormwater in municipal stormwater systems. The goal of the NPDES nonpoint source regulations is to improve the quality of stormwater discharged to receiving waters to the maximum extent practicable. The RWQCBs in California are responsible for implementing the NPDES permit system (see the discussion of state regulations below).

Section 303

Section 303(d) of the CWA requires states to develop lists of water bodies that do not attain water quality objectives after implementation of required levels of treatment by point source dischargers (municipalities and industries). Section 303(d) requires that the state develop a total maximum daily load (TMDL) for each of the listed pollutants. The TMDL is the amount of the pollutant that the water body can receive and still be in compliance with water quality objectives. The TMDL is also a plan to reduce loading of a specific pollutant from various sources to achieve compliance with water quality objectives. EPA must either approve a TMDL prepared by the state or disapprove the state's TMDL and issue its own. NPDES permit limits for listed pollutants must be consistent with the waste load allocation prescribed in the TMDL. After implementation of the TMDL, it is anticipated that the problems that led to placement of a given pollutant on the Section 303(d) list would be remediated.

Lake Tahoe TMDL

The Lake Tahoe TMDL was developed as a partnership between the Lahontan Regional Water Quality Control Board (Lahontan RWQCB) and the Nevada Division of Environmental Protection (NDEP), and approved by the EPA in 2011. The TMDL addresses the declining clarity and transparency of Lake Tahoe. Each TMDL represents a goal that may be implemented by adjusting pollutant discharge requirements in individual NPDES permits or establishing nonpoint source controls. Because California and Nevada must comply with, administer, and enforce their own state laws and policies, each state has developed its own Lake Tahoe TMDL to address the impairment of Lake Tahoe as addressed in each state's Section 303(d) filings with EPA.

California's Lake Tahoe TMDL (dated November 2010 and approved by EPA in 2011) requires attainment of the California transparency objective for Lake Tahoe over a 65-year implementation period. Based on California law, Lahontan RWQCB has the obligation to implement and enforce the California Lake Tahoe TMDL through NPDES discharge permits (over which EPA has jurisdiction) issued to California government entities (City of South Lake Tahoe, Placer County, El Dorado County, and the California Department of Transportation).

Federal Antidegradation Policy

The Federal Antidegradation Policy was enacted to provide protection to high-quality water resources of national importance. It directs states to develop and adopt statewide antidegradation policies that include protecting existing instream water uses and maintaining a level of water quality necessary to protect those existing uses and the water

quality of high-quality waters. In EPA's CWA regulations regarding water quality standards (40 CFR Chapter 1, Section 131.12[a][3]), the criteria for requiring an antidegradation standard includes: "where high quality waters constitute an outstanding National resource, such as waters of National and State parks and wildlife refuges and waters of exceptional recreational or ecological significance, that water quality shall be maintained and protected." The EPA has designated Lake Tahoe an Outstanding National Resource Water (ONRW). ONRWs are provided the highest level of protection under EPA's Antidegradation Policy, stipulating that states may allow some limited activities that result in temporary and short-term changes to water quality, but such changes should not adversely affect existing uses or degrade the essential character or special uses for which the water was designated an ONRW. The EPA interprets this provision to prohibit new or increased discharges to ONRWs that would degrade water quality.

TAHOE REGIONAL PLANNING AGENCY

Thresholds

Water quality standards adopted by TRPA set a target to return the lake to the transparency observed in the late 1960s. Six major indicator themes are currently used by TRPA to assess the water quality of Lake Tahoe and its tributaries. Table 3.10-1 lists each threshold category, indicator reporting category (indicator theme), and generalized characterization of current status, trend, and confidence (TRPA 2016).

Table 3.10-1 TRPA Summary of Findings by Threshold Category (Water Quality)

Threshold Category	Indicator Reporting Category (Indicator Theme)	Generalized Characterization of Current Status, Trend and Confidence[1]
Water Quality	Pelagic Lake Tahoe (open waters of Lake Tahoe)	Indicators range from somewhat worse than target to somewhat better than target, trending toward little or no change[1]. The exception to this is the indicator for Phytoplankton Primary Productivity, which is described as considerably worse than target with a trend toward rapid decline.
	Littoral Lake Tahoe (nearshore waters of Lake Tahoe)	Indicators are at or somewhat better than target with insufficient data to determine trend. There is insufficient data to determine the status or trend for Attached Algae or Aquatic Invasive Species.
	Tributaries	Suspended sediment concentrations in tributaries are considerably better than target; however, phosphorus and nitrogen concentrations are still worse than target for most tributary streams. There is insufficient data to determine the status of sediment and nutrient loading in tributaries, however these indicators are trending toward no change or moderate improvement.
	Surface Runoff (stormwater runoff to surface waters)	There is insufficient data to determine status or trend of Surface Runoff indicators.
	Groundwater (stormwater runoff to soil)	There is insufficient data to determine status or trend of Groundwater indicators.
	Other Lakes (Fallen Leaf Lake)	There is insufficient data to determine status or trend of indicators for Other Lakes.

[1] Range of Qualifiers from best to worst:

Possible Status Categories: Considerably better than, at or somewhat better than, somewhat worse than, considerably worse than, and insufficient data to determine status or no target established.

Possible Trend Categories: Rapid movement, moderate improvement, little or no change, moderate decline, rapid decline, and insufficient data to determine trend.

Source: TRPA 2016

Nearshore Water Quality

The quality of water in the nearshore area, the primary point of contact for most residents and visitors to the lake, is tracked by measuring turbidity, which is an indication of the cloudiness of water expressed in Nephelometric Turbidity Units (NTU). Higher turbidity measurements indicate cloudier water. TRPA maintains standards for

nearshore turbidity, <3 NTU in areas influenced by stream discharge, and <1 NTU in areas not influenced by stream discharge. Elevated turbidity measurements in the nearshore area of the lake, defined as levels exceeding 0.25 NTU, appear to be influenced by surface runoff from developed areas. While measures exceeding 0.25 NTU may be higher relative to other areas of the lake, they do not represent exceedance of the standard. Nearshore turbidity monitoring completed between November 2014 and November 2015 did not result in a single value that exceeded the <1 NTU standard (TRPA 2016).

Deep Water (Pelagic) Transparency and Clarity

Long-term changes to the transparency and clarity of Lake Tahoe are influenced by the amount of particulate material in the water, which includes inorganic particles that scatter light (e.g., fine sediment suspended in the water column) and organic particles that absorb light (e.g., suspended algae). Tahoe's transparency is currently 22 feet worse than 1968 values, based on average annual Secchi disk measurement (TERC 2018). In 2017 the average annual Secchi disk visibility depth measured from the surface of the lake was 59.7 feet, which is a 9.5-foot decrease from the previous year and the lowest value ever recorded (TERC 2018). The record low clarity was due to unusually poor winter clarity, which may be the result of high sediment loads from high and sustained stream flows in winter 2017 (TERC 2018).

Deep Water Primary Productivity

Primary productivity measures the rate at which algae grow. Measurements of primary productivity are expressed in grams of carbon per square meter (gC/m^2). Average annual measurements of primary productivity in the lake have trended upwards since 1968 at a rate of approximately eight percent per year (TRPA 2016). The interim target for this threshold indicator is a reduction in the rate of increase.

Other Thresholds

In addition to water quality thresholds and standards that specifically measure the water quality of Lake Tahoe, additional thresholds are used by TRPA to assess the quality of water in tributary streams to Lake Tahoe or other waters directly discharged to Lake Tahoe. These thresholds include standards that define: maximum allowable pollutant concentrations for various constituents in tributaries to Lake Tahoe; surface runoff concentrations discharged to surface waters; aquatic invasive species, periphyton (attached algae), surface runoff concentrations and discharged to land surfaces for infiltration; stormwater runoff to soil (affecting groundwater); and the quality of other lakes in the Tahoe Basin. Table 3.10-1, above, provides the current status for these additional Water Quality Indicator Reporting Categories.

Goals and Policies

TRPA has established a number of goals and policies related to water quality. Goals include the reduction of sediment and nutrients to Lake Tahoe and the elimination or reduction of other pollutants. Policies address a range of issues, including requirements for development projects to mitigate water quality impacts, collection of mitigation fees to fund restoration projects that help offset development impacts, and the requirement for all landowners to install and maintain water quality best management practices (BMPs).

Code of Ordinances

The TRPA Code contains the requirements and standards intended to achieve water quality thresholds, goals, and policies. Sections 60.1 and 60.2 of the TRPA Code are directed specifically at water quality, but a number of other chapters and sections contain provisions related to design and installation of BMPs and standards for grading and excavation (Table 3.10-2).

Table 3.10-2 Water Quality Code Requirements Related to the Project

TRPA Code Provision	Requirement
Section 33.3	Standards for grading and excavation. Grading is permitted only between May 1 and October 15.
Section 33.4	Requirements for special investigations, reports, and plans, determined to be necessary by TRPA to protect the environment against significant adverse effects from grading projects.
Section 33.5	Requirements for grading and construction schedules when grading or construction is to occur pursuant to a TRPA permit.
Chapter 35	Regulations pertaining to recognition of natural hazards, including floodplains, prevention of damage to property, and protection of public health relating to such natural hazards. The TRPA Code prohibits development, grading or filling of lands within 100-year floodplains with certain exceptions, including specific public outdoor recreation facilities, public health or safety facilities, access to buildable sites across a floodplain, and erosion control projects or water quality control facilities when it can be proven there are no viable alternatives and all potential impacts can be minimized (TRPA 2012).
Section 60.1	Discharge standards for runoff and discharge to surface and groundwater.
Section 60.2	For projects that result in increased impervious coverage, implementation of offsite water quality control or stream environment zone mitigation projects is required; or payments into the Water Quality Mitigation Fund.
Section 60.4	Runoff shall be controlled with implementation of BMPs. Alternative BMPs may be allowed where special circumstances exist.

Source: TRPA 2012

Numerical discharge standard limitations are specified in the TRPA Code for nitrogen, phosphorus, iron, turbidity, suspended sediments, and grease and oil. Pollutant concentrations in surface runoff may not exceed the concentrations listed in Table 3.10-3 at the 90th percentile for discharge to surface waters. Surface runoff infiltrated into soils may not exceed the concentrations listed in Table 3.10-3 for discharge to groundwater. In addition to numerical discharge limits, the TRPA Code also restricts the discharge of wastewater and toxic substances, and sets requirements for snow removal, salt and abrasive use, and pesticide use and fertilizer control.

Table 3.10-3 TRPA Discharge Limits for Surface Runoff and Discharge to Groundwater

Constituent	Maximum Concentration
Surface Runoff	
Dissolved Inorganic Nitrogen as N	0.5 mg/l
Dissolved Phosphorus as P	0.1 mg/l
Dissolved Iron as Fe	0.5 mg/l
Grease and Oil	2.0 mg/l
Suspended Sediment	250 mg/l
Discharge to Groundwater	
Total Nitrogen as N	5 mg/l
Total Phosphate as P	1 mg/l
Iron as FE	4 mg/l
Turbidity	200 NTU
Grease and Oil	40 mg/l

Source: TRPA 2012

Placer County Tahoe Basin Area Plan

The Implementing Regulations of the Placer County Tahoe Basin Area Plan incorporates Chapter 60, Water Quality, of the TRPA Code in its entirety.

CALIFORNIA

State Water Resources Control Board

In California, the State Water Resources Control Board (SWRCB) has broad authority over water quality control issues for the state. SWRCB is responsible for developing statewide water quality policy and exercises the powers delegated to the state by the federal government under the CWA. Other state agencies with jurisdiction over water quality regulation in California include the California Department of Health Services (DHS) (for drinking water regulations), the California Department of Pesticide Regulation, the California Department of Fish and Wildlife, and the Office of Environmental Health and Hazard Assessment. Regional authority for planning, permitting, and enforcement is delegated to the nine RWQCBs. RWQCBs are required to formulate and adopt water quality control plans for all areas in the region and establish water quality objectives in the plans. Lahontan RWQCB is responsible for the water bodies in the project vicinity.

Water Quality Control Plan for the Lahontan Basin

Water quality standards and control measures for surface and ground waters of the Lahontan Region are contained in the Water Quality Control Plan for the Lahontan Region (Basin Plan). The Basin Plan designates beneficial uses for water bodies. It establishes water quality objectives, waste discharge prohibitions, and other implementation measures to protect those beneficial uses. Chapter 5 of the Basin Plan, Water Quality Standards and Control Measures for the Lake Tahoe Basin, summarizes a variety of control measures for the protection and enhancement of Lake Tahoe.

The Basin Plan was first adopted in 1975, and most recently updated in 2014. The Basin Plan contains both narrative and numeric water quality objectives for the region. The Basin Plan amendments include additional language related to: "mixing zones" for dilution of discharged water, compliance schedules for NPDES permits, discharge prohibition exemptions for low threat discharges such as incidental runoff from landscape irrigation or construction dewatering, simplification of existing prohibition exemptions, and the removal of language describing programs administered by TRPA (Lahontan RWQCB 2014).

Waste Discharge Prohibition for the Lake Tahoe Hydrologic Unit

The Basin Plan prohibits the discharge of any waste or deleterious material to the surface waters of Lake Tahoe, the 100-year floodplain of any tributary to Lake Tahoe, or any SEZ within the Lake Tahoe hydrologic unit. Lahontan RWQCB may grant an exception for public service facilities provided that the following findings can be made:

- the project is necessary for public health, safety, or environmental protection;
- there is no reasonable alternative, including spans that avoids or reduces the extent of encroachment;
- the impacts are fully mitigated;
- SEZ lands are restored in an amount of 1.5 times the area of SEZ developed or disturbed by the project; and
- wetlands are restored in an amount at least 1.5 times the area of wetland disturbed or developed. Certain wetlands may require restoration of greater than 1.5 times the area developed or disturbed.

National Pollutant Discharge Elimination System Permits

SWRCB and Lahontan RWQCB have required specific NPDES permits for a variety of activities that have potential to discharge pollutants to waters of the state and adversely affect water quality. To receive an NPDES permit a Notice of Intent to discharge must be submitted to Lahontan RWQCB and design and operational BMPs must be implemented to reduce the level of contaminated runoff. BMPs can include the development and implementation of various practices, including educational measures (workshops informing public of what impacts result when household chemicals are dumped into storm drains), regulatory measures (local authority of drainage facility design), public policy measures (label storm drain inlets as to impacts of dumping on receiving waters), and structural measures (filter strips, grass swales, and retention basins). All NPDES permits also have inspection, monitoring, and reporting requirements.

General Permit for Stormwater Discharges Associated with Construction Activity in the Lake Tahoe Basin

Lahontan RWQCB adopted the NPDES Construction Stormwater General Permit for the Lake Tahoe Basin in March 2016 (Order No. R6T-2016-0010). Projects disturbing more than 1 acre of land during construction must file a Notice of Intent with Lahontan RWQCB to be covered under this permit. Construction activities subject to the Lake Tahoe Construction Stormwater Permit include clearing, grading, stockpiling, and excavation. Dischargers are required to eliminate or reduce non-stormwater discharges to storm sewer systems and other waters. A stormwater pollution prevention plan (SWPPP) must be developed and implemented for each site covered by the permit. The SWPPP must include BMPs designed to prevent construction pollutants from contacting stormwater and keep products of erosion from moving offsite into receiving waters throughout the construction and life of the project; the BMPs must address source control and, if necessary, pollutant control. BMPs would conform to Chapter 4.5 of the Tahoe BMP Handbook.

State Nondegradation Policy

In 1968, as required under the federal antidegradation policy described previously, SWRCB adopted a nondegradation policy aimed at maintaining high quality for waters in California. The nondegradation policy states that the disposal of wastes into state waters shall be regulated to achieve the highest water quality consistent with maximum benefit to the people of the state and to promote the peace, health, safety, and welfare of the people of the state. The policy states:

a) Where the existing quality of water is better than required under existing water quality control plans, such quality would be maintained until it has been demonstrated that any change would be consistent with maximum benefit to the people of the state and would not unreasonably affect present and anticipated beneficial uses of such water.

b) Any activity which produces waste or increases the volume or concentration of waste and which discharges to existing high-quality waters would be required to meet waste discharge requirements.

Safe Drinking Water Act

As mandated by the Safe Drinking Water Act (Public Law 93-523), passed in 1974, EPA regulates contaminants of concern to domestic water supply. Such contaminants are defined as those that pose a public health threat or that alter the aesthetic acceptability of the water. These types of contaminants are regulated by EPA primary and secondary Maximum Contaminant Levels (MCLs). MCLs and the process for setting these standards are reviewed triennially. Amendments to the Safe Drinking Water Act enacted in 1986 established an accelerated schedule for setting drinking water MCLs. EPA has delegated to the DHS the responsibility for California's drinking water program. DHS is accountable to EPA for program implementation and for adoption of standards and regulations that are at least as stringent as those developed by EPA. Title 22 of the California Administrative Code (Article 16, Section 64449) defines secondary drinking water standards, which are established primarily for reasons of consumer acceptance (i.e., taste) rather than for health issues.

LOCAL

Placer County Code

The Placer County Code is the implementing mechanism for the goals and policies of the General Plan. Portions of the County Code dealing with a specific issue are referred to as ordinances. Specific ordinances relevant to hydrology and water quality include the Stormwater Ordinance (Section 8.28 of the Placer County Code) and the Flood Damage and Prevention Ordinance (Section 15.52 of the Placer County Code). The Stormwater Ordinance includes discharge prohibitions, requirements for BMP installation and reduction of stormwater flows, and enforcement mechanisms. The Flood Damage and Prevention Ordinance includes standards for construction in or near flood areas and prohibits actions that would raise flood elevations or increase the risk of flood damage to existing structures.

3.10.2 Environmental Setting

HYDROLOGY

Regional Hydrology

The Lake Tahoe Basin was formed approximately 2 to 3 million years ago by geologic faulting and volcanic activity. Geologic faults running in a north-south direction allowed the formation of a valley between the uplifting Sierra Nevada and the Carson Range. The northeastern portion of the valley was blocked and dammed by volcanic activity to create the 506 square mile basin that lies along the California-Nevada border. Precipitation and runoff eventually filled a portion of the basin to create Lake Tahoe, which has a water surface area covering nearly two-fifths of the total basin area (191 square miles).

Lake Tahoe is fed by 63 tributary streams and 52 intervening zones that drain directly to the lake. The Truckee River at the northwest end of the Tahoe Basin is the lake's only outlet, flowing to Pyramid Lake in Nevada. A dam constructed at Tahoe City in the early 1900s regulates water flow to the Truckee River from the natural rim (6,223 feet above sea level) to the maximum legal Lake level of 6,229.1 feet. The Lake is 12 miles wide and 22 miles long, with 72 miles of shoreline.

Average precipitation, measured at almost 34 inches a year at Tahoe City (U.S. Climate Data 2019), generally falls as snow in the higher elevations and as snow and rain in the lower elevations, including the lake shore from October to May. Peak stream runoff in the watersheds of interest is typically triggered by spring snowmelt in May and June. The snowpack near the lakeshore predominantly melts before the peak in snowmelt and runoff from the higher elevations.

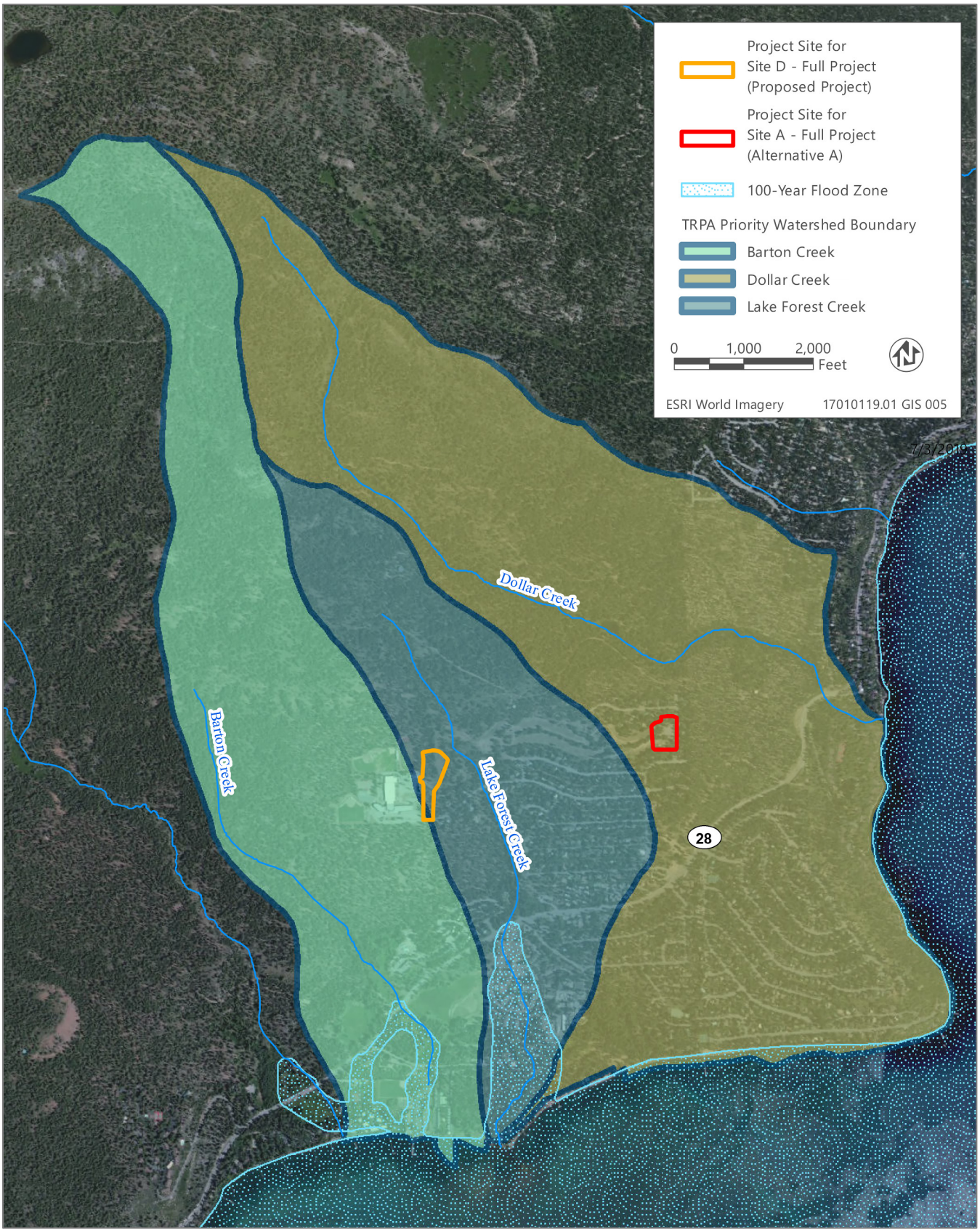
Land cover within the Lake Tahoe Basin is primarily forest, with areas of granitic outcrops and meadows. Regional topography is characterized by steep mountain slopes at higher elevations, transitioning to more moderately sloped terrain near the lakeshore.

Local Hydrology

The Project area includes portions of three TRPA delineated sub-watersheds (see Figure 3.10-1). Alternative A is located approximately 700 feet south of the perennial Dollar Creek, in the 1,166-acre Dollar Creek watershed. The proposed Project is located predominately within the Lake Forest Creek watershed, although approximately 0.25 acre of the site crosses over into the Barton Creek watershed. Lake Forest Creek is an intermittent stream in the reach that passes approximately 200 feet to the east of the proposed Project. The Lake Forest Creek Watershed is approximately 447 acres.

100-Year Floodplain

The Federal Emergency Management Agency (FEMA) provides mapping showing areas that would be inundated by a 100-year flood. The 100-year floodplain refers to the area that would be inundated by a flood that has a one percent chance of occurring in any given year. The 100-year flood is the national minimum standard to which communities regulate their floodplains. There are no mapped 100-year floodplains within the area containing the proposed Project site and Alternative A site.



Source: Data downloaded from FEMA in 2014, received from TRPA in 2011 and adapted by Ascent Environmental in 2019

Figure 3.10-1 Watershed and Flood Zone Map

SURFACE WATER QUALITY

Lake Tahoe

Lake Tahoe is classified by limnologists as an oligotrophic lake, which means the lake has very low concentrations of nutrients that can support algal growth, leading to clear water and high levels of dissolved oxygen (TERC 2011:6.15). The exceptional transparency of Lake Tahoe results from naturally low inputs of nutrients and sediment from the surrounding watersheds. The most recent scientific research points to inorganic fine sediment particles (particles defined as less than 16 micrometers in diameter) as the primary pollutant of concern impairing Lake Tahoe's transparency. This finding is based on the ability of inorganic fine sediment particles to efficiently scatter light and decrease observed transparency. Swift et al. (2006) determined that light scattering by inorganic particles for the period between 1999 and 2002 was responsible for approximately 55 to 60 percent of measured light attenuation in the lake. Additional pollutants of concern include phosphorus and nitrogen, which stimulate algal growth in the lake contributing to declines in transparency and quality of the near-shore environment.

Research during the development of the Lake Tahoe TMDL included an analysis of pollutant sources to identify the magnitude of pollutant loads to Lake Tahoe from specific source categories. These categories were defined as: surface runoff from developed lands (urban watershed); atmospheric deposition; forested runoff (non-urban watershed); stream channel erosion; groundwater; and shoreline erosion. The Lake Tahoe TMDL identifies surface runoff from developed lands as the most significant source of pollutant loading for fine sediment particles and phosphorus. For example, developed lands are estimated to deliver over 70 percent of the average annual fine sediment particle load and approximately 40 percent of the average annual phosphorus load to the lake. For nitrogen, atmospheric deposition is identified as the most significant source of loading to the lake, contributing 55 percent of the average annual load. (Lahontan RWQCB and NDEP 2010)

The Lake Tahoe TMDL established the goal of restoring Lake Tahoe's historic deep water transparency to 29.7 meters (97.4 feet) annual average Secchi depth (Lahontan RWQCB and NDEP 2010). The deep-water transparency water quality objective for Lake Tahoe has not been met since its adoption. To achieve the transparency standard, estimated fine sediment particle, phosphorus, and nitrogen loads must be reduced by 65 percent, 35 percent, and 10 percent, respectively. It is anticipated that attainment of these load reduction standards will take 65 years from implementation (Lahontan RWQCB and NDEP 2010).

A 20-year interim transparency goal, known as the Clarity Challenge requires Tahoe Basin-wide pollutant load reductions to be achieved within 15 years, followed by 5 years of monitoring to confirm that 24 meters of Secchi depth transparency has been reached. To attain the goals of the Clarity Challenge, implementation efforts must reduce Tahoe Basin-wide fine sediment particle, phosphorus, and nitrogen loads by 32 percent, 14 percent, and 4 percent, respectively, over the 15-year period.

Streams

Traditional development activities increase impervious and disturbed areas within watersheds and result in an increase in the amount of flow and sediment that a stream must transport. Sediment entering streams may come from floodplains, upland slopes, urban runoff, or stream bank erosion. Stream systems influenced by watershed disturbance typically show stream channel degradation and increased bank erosion (Lahontan RWQCB and NDEP 2010). Additionally, pollutants such as phosphorus and nitrogen are often attached to sediment particles, further degrading water quality. In 2006, an analysis of sediment loading was completed for all 63 streams that flow into Lake Tahoe (Simon 2006). This study showed that one percent or less of the fine sediment contributed by Lake Forest and Dollar Creeks was generated by stream bank erosion, indicating that the watersheds are relatively stable and not greatly disturbed. Little additional water quality data is available for these streams; however, it is likely that they are affected by runoff from adjacent neighborhoods and roadways. While no portion of these streams are designated as impaired under Section 303 of the CWA, the steams are tributaries to Lake Tahoe and are included in the Lake Tahoe TMDL.

Two restoration projects have been completed on the lower reaches of Lake Forest Creek to remove fill and reconnect historic stream channels and meadows. Dollar Creek is impounded approximately 1,500 feet upstream from the proposed Project site. Dollar Reservoir is roughly one acre in size and sits behind a dam that is 14 feet in height and 400 feet in length. The dam and reservoir currently serve only as a recreational destination.

GROUNDWATER

The most extensive and productive groundwater reservoirs (aquifers) in the Lake Tahoe Basin are composed of course textured alluvial deposits and deposits of glacial till and outwash. Five aquifers have been defined around the Lake Tahoe Basin, generally based on surface contact between basin fill and bedrock. The proposed Project site and Alternative A site are located within the Tahoe City/West Shore aquifer (USGS 2007).

The Tahoe City/West Shore aquifer extends from Dollar Point to Rubicon Bay with a shoreline distance of 18 miles. In the area around the lake outlet at Tahoe City, the aquifer consists of a complex series of sediment layers including silt and clay lake sediments layered with sand, overlying volcanic flows, which are then underlain by ancient, water-bearing sand and gravel deposits, extending from approximately 60 feet to 590 feet (USGS 2007). South of Tahoe City, the West shore is drained by a series of glacially cut watersheds separated by moraines (glacial till ridges). In general, each watershed is underlain by glacial outwash and stream deposits (mostly sands and gravels) with fill depths between 50 and 450 feet.

Groundwater recharge within the area containing the proposed Project site and Alternative A site occurs via infiltration into faults and fractures in the bedrock, into the soil and decomposed granite that overlies much of the bedrock, and into unconsolidated basin-fill deposits. Groundwater quality is good, with no contamination reported (Tahoe City Public Utility District [TCPUD] 2014, California Department of Water Resources [DWR] 2003).

3.10.3 Environmental Impacts and Mitigation Measures

METHODS AND ASSUMPTIONS

The evaluation of potential hydrology and water quality impacts is based on a review of documents pertaining to the Project area, including previous studies conducted for local watersheds, environmental impact reports, background reports prepared for plans and projects in the vicinity, and published and unpublished hydrologic literature. The information obtained from these sources was reviewed and summarized to understand existing conditions and to identify potential environmental effects, based on the thresholds of significance. In determining the level of significance, the analysis assumes that the proposed Project would comply with relevant federal, state, and local laws, regulations, and ordinances.

SIGNIFICANCE CRITERIA

CEQA Criteria

Based on Appendix G of the State CEQA Guidelines, the Project would result in a potentially significant impact to hydrology and water quality if it would:

- violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;
- substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;
- substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream of river or through the addition of impervious surfaces, in a manner which would:
    - result in substantial erosion or siltation on or off site;

- substantially increase the rate or amount of surface runoff in a manner which would result in flooding on or off site; or
- create or contribute runoff water which would exceed the capacity of exiting or planned stormwater drainage system or provide substantial additional sources of polluted runoff;

- conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

TRPA Criteria

The "Water Quality" criteria from the TRPA Initial Environmental Checklist were used to evaluate the hydrology and water quality impacts of the project. Checklist items that are relevant to the Project have been included in the environmental analysis below. Impacts to hydrology and water quality would be significant if it would:

- discharge into surface waters, or alter surface water quality, including but not limited to temperature, dissolved oxygen, or turbidity;
- cause the potential discharge of contaminants to the groundwater or alter groundwater quality; or
- change absorption rates, drainage patterns, or the rate and amount of surface water runoff so that the 20-year, 1-hour storm runoff (approximately 1 inch per hour) cannot be contained on the site.

ENVIRONMENTAL EFFECTS OF THE PROJECT

Impact 3.10-1: Potential for Project Construction to Degrade Surface or Groundwater Quality

The proposed Project and Alternative A would create Project specific construction-related disturbance, which would have the potential to degrade water quality. However, existing TRPA, Lahontan RWQCB, and Placer County regulations and standard permit conditions would substantially reduce the risk of construction-related stormwater quality impacts by controlling construction site contaminants (such as sediment-laden runoff and construction chemicals), and by proper management of hazardous materials onsite. Because stringent regulatory protections are in place, construction activities from the implementation of the proposed Project and Alternative A would have a **less-than-significant** impact on water quality.

Proposed Project

Implementation of the proposed Project would result in soil-disturbing activities, including clearing, excavating, filling, grading, and temporary stockpiling of soils associated with construction of the Schilling Lodge. No construction is proposed at the Highlands Community Center. These activities could expose soils to wind and water erosion and potentially transport pollutants to surface water bodies, particularly during storm events. In addition, the demolition of existing structures would generate debris. Soil and small pieces of debris exposed during construction activities could be carried offsite through construction vehicle traffic or washed off the exposed areas and transported to adjacent SEZ areas or Lake Tahoe. Finally, there would be onsite construction staging of equipment and vehicles, as well as construction-related vehicle trips. Fuels and other construction-related chemicals could be accidentally spilled or leaked or could otherwise be discarded into nearby stormdrains or drainages. If pollutants reach drainages, they could ultimately be discharged to Lake Tahoe.

Although construction activities have the potential to adversely affect surface and groundwater quality, the proposed Project would be required to comply with stringent TRPA, Lahontan RWQCB, and Placer County water quality protections. Temporary construction BMPs that would be required through existing regulations, such as Chapter 33 of the TRPA Code summarized under "Code of Ordinances" in Section 3.10.1, "Regulatory Setting," would include but not be limited to:

- Temporary erosion control BMPs (e.g., silt fencing, fiber rolls, drain inlet protection) installed and maintained to prevent the transport of earthen materials and other waste from a construction site.
- Tree protection fencing installed around trees that are to remain in place throughout construction.

- Mandatory pre-grading inspections by regulatory agencies at the construction site to ensure proper installation of the temporary construction BMPs before the initiation of construction activities.
- Requirements to limit the area and extent of all excavation to avoid unnecessary soil disturbance.
- Requirements to winterize construction sites by October 15 to reduce the water quality impacts associated with winter weather. Winterization typically includes installation of erosion controls, vegetation protection, removal of construction debris, site stabilization, and other measures.
- Dust control measures to prevent transport of materials from a project site into any surface water or drainage course. Dust control measures typically include sweeping, watering, covering of disturbed soils and stockpiles, vehicle washing, and other measures.
- Requirements to remove surplus or waste earthen materials from a project site, as well as requirements to stabilize and protect stockpiled material.
- Stabilization of drainage swales disturbed by construction activities with appropriate soil stabilization measures (e.g., revegetation, rock armoring) to prevent erosion.
- Temporary BMPs to capture and contain pollutants from fueling operations, fuel storage areas, and other areas used for the storage of hydrocarbon based materials. These may include spill prevention plans and other measures.
- Temporary BMPs to prevent the tracking of earthen materials and other waste materials from a project site to offsite locations, including stabilized points of entry/exit for construction vehicles/equipment, designated vehicle/equipment rinse stations, and sweeping operations.
- Regular inspection and maintenance of temporary BMPs.

All construction projects in California with greater than 1 acre of disturbance must, in advance of the construction, prepare a SWPPP pursuant to the NPDES Phase II Stormwater Program and in support of a Construction Stormwater General Permit. A project-specific SWPPP describes the site, construction activities, proposed erosion and sediment controls, means of waste disposal, maintenance requirements for temporary BMPs, and management controls for potential pollutant sources other than stormwater runoff. The SWPPP also includes a site-specific construction site monitoring and reporting plan. In addition, the SWPPP would require the implementation of a hazardous materials spill response plan, which would reduce the potential of directly and indirectly effecting water quality through construction-related hazardous material spills. Water quality controls outlined in a SWPPP must be consistent with TRPA requirements (including Chapter 4.5 of the TRPA BMP Handbook), the federal antidegradation policy, and maintain designated beneficial uses of Lake Tahoe.

In addition to TRPA and Lahontan RWQCB permit enforcement, it is the accepted practice of the Placer County Engineering and Surveying Division to require inclusion of pertinent regulatory compliance measures as conditions of grading permits for projects within the county. This practice creates an additional layer of regulatory oversight and review, and facilitates communication between Placer County and the regulatory agencies.

The proposed Project would be subject to existing laws and regulations requiring erosion and sediment controls required by TRPA, Lahontan RWQCB, and Placer County, as described above and, in compliance with those laws and regulations would implement and maintain temporary construction BMPs to capture, detain, and infiltrate or otherwise control and properly manage site runoff; implement waste control measures to prevent leakage or spill of hazardous materials into soil and surface waters; and manage controls for stormwater runoff to prevent erosion and offsite transport of earth materials. Because the applicant would implement the measures described herein and regulatory protections are in place to minimize erosion and transport of sediment and other pollutants, construction-related impacts would be effectively controlled. Therefore, this impact would be **less than significant**.

Alternative A

Implementation of Alternative A would include the demolition of the Existing Lodge and the reconstruction of the Schilling Lodge of the same size and layout as the proposed Project. The demolition process would generate construction debris that could be carried offsite via construction vehicle traffic or washed off the exposed areas and transported to adjacent storm drains or drainages. The construction-related vehicle staging and use of fuel and related chemicals would be the same as described for the proposed Project.

As described for the proposed Project, Alternative A would be subject to existing laws and regulations requiring erosion and sediment controls required by TRPA, Lahontan RWQCB, and Placer County, as described above and, in compliance with those laws and regulations would implement and maintain temporary construction BMPs to capture, detain, and infiltrate or otherwise control and properly manage site runoff; implement waste control measures to prevent leakage or spill of hazardous materials into soil and surface waters; and manage controls for stormwater runoff to prevent erosion and offsite transport of earth materials. Because the applicant would implement the measures described herein and stringent regulatory protections are in place to reduce erosion and transport of sediment and other pollutants, construction-related impacts would be effectively controlled. Therefore, this impact would be **less than significant**.

Mitigation Measures

No mitigation is required for this impact.

Impact 3.10-2: Potential for Changes in Land Use or Facility Operation to Degrade Surface or Groundwater Quality

The proposed Project would result in the development of the Schilling Lodge on forested lands designated for recreation. Similarly, Alternative A would include the redevelopment and expansion of an existing building. The proposed Project and Alternative A have the potential to generate pollutants that could be carried in stormwater runoff to surface waters. However, TRPA and Lahontan RWQCB regulations require the installation and maintenance of water quality BMPs, which would reduce the potential water quality effects the proposed development. Also, TRPA Code provisions would require fertilizer management and snow storage BMPs to prevent potential adverse effects from these activities. Because these stringent protections are in place, the potential for operation of the facilities associated with the proposed Project and Alternative A to degrade water quality would be a **less-than-significant** impact.

Proposed Project

Implementation of the proposed Project would result in construction of new development on a relatively undisturbed site. Additionally, the existing community center would continue to serve community needs and would require continued maintenance and upkeep. The use of these facilities could result in the accidental discharge of household and commercial products or improper use of pesticides and fertilizers, which could be carried in runoff or infiltrated into the soil reaching surface and groundwater resources. Additionally, urban stormwater runoff and snow melt from the proposed Project site could contain oil and roadway residue, fine sediment, and other pollutants.

The potential for water quality degradation from use of pesticides and fertilizers is addressed in the TRPA Code. All projects that require revegetation must submit a revegetation plan that specifies the use of approved plant species and a schedule of the amount and method of application of any necessary fertilizers in accordance with TRPA Code Section 61.4.5. TRPA Code Section 36.7 and the TRPA BMP Handbook (TRPA 2014) require that landscaped areas use native or adapted plant species that require little water and fertilizer and are appropriate for the site conditions.

Melt water from snow storage areas carries concentrated amounts of nutrients, fine sediments, salt, sand pollutants from vehicles such as petroleum hydrocarbons, oil, or heavy metals and materials from road and tire wear. All potential snow storage areas included in the proposed Project would be designed to drain to BMP facilities capable of treating large sediment loads. In accordance with TRPA Code Section 60.1.4, all snow storage areas would meet the site criteria and management standards in the TRPA Handbook of Best Management Practices (TRPA 2014). In addition, snow storage areas may not be located within SEZs.

As required by TRPA, Lahontan RWQCB, and Placer County, permanent BMPs are proposed for the proposed Project site. TRPA Code Chapter 60 requires that all projects be designed to accommodate the volume of surface water generated by a site during a 20-year, 1-hour storm. This can be accomplished through use of low impact development (LID) techniques to infiltrate stormwater as close to its source as possible, construction of infiltration basins, and strategic placement of landscaped areas to capture runoff. LID practices and proposed permanent BMPs for this Project include detention basins, dripline infiltration trenches, roadside infiltration trenches, rain gardens, underground infiltration chambers, and pervious paver units. These elements would be incorporated into the proposed landscape plan, which would also provide source control to reduce stormwater impacts to the watershed. All permanent BMPs would be designed to ensure compliance with the TRPA Code.

The potential for the operation of the proposed Project to degrade surface and groundwaters would be controlled through compliance with the surface and groundwater discharge standards found in Chapter 60 of the TRPA Code. In addition to the water quality protections in the required NPDES permits, TRPA has established numeric water quality standards for discharges to surface and ground waters. Section 61.1 of the TRPA Code specifies that water discharged to surface waters or infiltrated into soils should not contain excessive amounts of nutrients, sediment, or oil and grease. The TRPA numeric discharge limits are shown in Table 3.10-3 above. Where there is a direct hydrologic connection between ground and surface waters, discharge to groundwater must meet surface water discharge standards. The existence of a direct hydrologic connection is assumed to exist when, due to proximity to surface water, slope, or soil characteristics, the discharged water does not remain in the soil long enough to remove pollutants.

TRPA and Lahontan RWQCB regulations require the installation and maintenance of water quality BMPs, which would reduce the potential water quality effects the proposed development. Also, TRPA Code provisions would require fertilizer management and snow storage BMPs to prevent potential adverse effects from these activities. The applicant would be required to demonstrate to the permitting agencies that the Project design would comply with applicable regulatory requirements as part of the permit application and approval process. Because these protections are in place, the potential for operation of the facilities associated with the proposed Project to degrade water quality would be a **less-than-significant** impact.

Alternative A

Implementation of Alternative A would include the demolition of the Existing Lodge and the reconstruction of the Schilling Lodge of the same size and layout as the proposed Project. The Schilling Lodge would support an increased number of events. Operational contaminants could be carried in concentrated stormwater runoff and reach surface waters or be infiltrated into groundwater. However, as described above, TRPA and Lahontan RWQCB regulations require the installation and maintenance of water quality BMPs, which would reduce the potential water quality effects the proposed development. Also, TRPA Code provisions would require fertilizer management and snow storage BMPs to prevent potential adverse effects from these activities. The applicant would be required to demonstrate to the permitting agencies that the Project design would comply with applicable regulatory requirements as part of the permit application and approval process. Because these protections are in place, the potential for operation of the facilities associated with Alternative A to degrade water quality would be a **less-than-significant** impact.

Mitigation Measures

No mitigation is required for this impact.

Impact 3.10-3: Potential for Increase in Stormwater Runoff, Impacts to Existing Drainage Systems, or Alteration of Drainage Patterns

The proposed Project and Alternative A would include new development, which would create increased impervious surfaces and increased runoff. However, the Project would be required to meet stormwater BMP standards and to demonstrate through subsequent drainage planning that each of the sites for the proposed Project and Alternative A would be able to capture and treat stormwater during peak flows, as required by TRPA and Placer County regulations. For these reasons, the potential for the proposed Project and Alternative A to create substantial adverse effects on stormwater runoff volumes and existing drainage systems would be **less-than-significant**.

Proposed Project

The peak flow and volume of stormwater runoff generated from an area is affected by development through conversion of vegetated and otherwise pervious surfaces to impervious surfaces (e.g., roads, roofs, driveways, walkways) and by the development of drainage systems that connect these impervious surfaces to streams or other water bodies. In this way, development can increase the rate and volume of runoff and eliminate storage and infiltration that would naturally occur along drainage paths.

The proposed Project involves the development of the Schilling Lodge and associated parking improvements in an undeveloped lot, which would increase the amount of impervious surfaces (known as land coverage) on the proposed Project site by 81,593 sq. ft. (See Impact 3.9-3, "Potential for Compaction or Land Coverage Beyond TRPA Limits," in Section 3.9, "Geology, Soils, Land Capability, and Coverage," for a more detailed discussion of existing and proposed coverage.) No construction is proposed at the Highlands Community Center that would result in potential impacts related to stormwater runoff and drainage. This would create a corresponding increase in the volume of stormwater runoff generated by the proposed Project site. However, the proposed increase in coverage would occur on high capability lands and would be required to meet existing BMP standards (Section 60.4.6 of the TRPA Code) to control potential increases in stormwater runoff and pollutant loading. As discussed above, TRPA Code Chapter 60 requires that all projects be designed to accommodate the volume of surface water generated by a site during a 20-year, 1-hour storm. Additionally, Placer County requires that peak stormwater flows from the proposed Project site be attenuated to at or below pre-Project peak flow rates utilizing stormwater detention basins, bioswales, rain gardens, infiltration chambers, dripline infiltration trenches, and roadside infiltration trenches. In support of required permits, a drainage report would be prepared by the Project applicant and submitted to Placer County and TRPA with stormwater calculations demonstrating the ability of the stormwater elements to control peak flows. The report would be prepared by a Registered Civil Engineer and, at a minimum, would include: written text addressing existing conditions, the effects of the proposed improvements, all appropriate calculations, watershed maps, changes in flows and patterns, and proposed onsite and offsite improvements and drainage easements to accommodate flows from the Project. The proposed Project's stormwater management systems would need to be maintained over time and the proposed devices would be selected by location and ease of maintenance.

The proposed Project would include new development that would create increase impervious surfaces and increased runoff. However, the proposed Project would be required to meet stormwater BMP standards and to demonstrate through subsequent drainage planning that the proposed Project site is able to capture and treat stormwater during peak flows, as required by TRPA and Placer County regulations as described herein and under Impact 3.9-3. Therefore, the potential for the proposed Project to increase runoff or adversely affect drainage systems would be **less than significant**.

Alternative A

Implementation of Alternative A would include the demolition of the Existing Lodge and the reconstruction of the Schilling Lodge of the same size and layout as the proposed Project. Because implementation of Alternative A would redevelop an existing facility, the net increase in coverage and associated stormwater runoff would be less than is expected for the proposed Project (when considering that the proposed Project would retain the existing Community Center), with 67,619 sq. ft. of new coverage. (See Impact 3.9-3, "Potential for Compaction or Land Coverage Beyond TRPA Limits," in Section 3.9, "Geology, Soils, Land Capability, and Coverage," for a more detailed discussion of

existing and proposed coverage.) The Alternative A would be subject to the same stormwater BMP standards and drainage planning and permitting requirements discussed above for the proposed Project. Because existing TRPA and Placer County regulations are in place to ensure that implementation of Alternative A would appropriately manage stormwater runoff and drainage, this impact would be **less than significant**.

Mitigation Measures

No mitigation is required for this impact.

CUMULATIVE IMPACTS

Cumulative impacts to water quality are considered in the context of the Lake Tahoe Basin. Rapid development during the 1960s is believed to be the cause of the lake's decline in clarity (Lahontan RWQCB and NDEP 2010) and the existing adverse cumulative condition. The lake was listed as an impaired water under Section 303(d) of the CWA and a TMDL was established to reverse the downward trend in water quality and bring lake clarity back to levels seen in 1967–1971. Regulatory agencies have recognized the threats to water quality in the Tahoe Region and have adapted their policies to reflect the TDML requirements and protect this unique natural resource. As described previously in this section, development and construction activities that could result in erosion, release of pollutants, or encroachment within floodplain or sensitive habitats are highly regulated by TRPA, Lahontan RWQCB, NDEP, and federal and local agencies.

The proposed Project, Alternative A, and the cumulative projects, through construction-related disturbance and increases in land coverage, have the potential to increase the volume of stormwater runoff, thereby increasing the concentrations of fine sediment particles, nutrients, and other pollutants in the surface and groundwaters of the Lake Tahoe Basin. Improper use of fertilizers and snow storage in unprotected areas or in close proximity to SEZs can also introduce pollutants into surface and groundwaters. These potential effects are controlled through compliance with a suite of protective regulations. Any project exceeding one acre in size is required to develop a SWPPP that identifies water quality controls that are consistent with Lahontan RWQCB and TRPA regulations. The SWPPP must include construction site BMPs, a spill prevention plan, and daily inspection and maintenance of temporary BMPs, and post construction BMPs to protect water quality during the life of the Project. In addition, TRPA requires all projects to include permanent water quality BMPs that control sources of sediment and urban pollutants. Any project with a landscape or vegetation component must develop a fertilizer management plan and snow storage areas must be located away from SEZs and equipped with any necessary BMPs. Additionally, because retrofitting existing development with water quality BMPs has been difficult to enforce, water quality improvements are often seen through new development or redevelopment processes where these BMPs are required as a condition of permit approval. TRPA also requires that each project be designed to infiltrate the 20-year, 1-hour design storm event. In special circumstances where this is not feasible, the Project must provide documentation that its stormwater is fully infiltrated by an offsite facility (TRPA Code Section 60.4). Because of the strong protective water quality regulations within the Tahoe region, the potential effects of the proposed Project, Alternative A, and other cumulative projects would be reduced such that the proposed Project and Alternative A **would not contribute** to the existing adverse cumulative water quality condition.

This page intentionally left blank.