

3.9 FLOODPLAINS

This section describes the potential impacts to existing hydrology and regulated floodplains resulting from the implementation of the US 50/South Shore Community Revitalization Project. The analysis includes a description of existing conditions and an analysis of changes to hydrologic conditions and floodplain elevations. Regulations and guidelines established by the Tahoe Regional Planning Agency (TRPA) and local jurisdictions, along with the California Environmental Quality Act (CEQA) statute and guidelines, provide the regulatory background that guides the assessment of potential environmental effects to these resources. Potential environmental effects related to water quality resulting from soil erosion and other stormwater issues are addressed in Section 3.10, “Water Quality and Stormwater Runoff.” In addition, a discussion of potential impacts resulting from a seiche wave in Lake Tahoe is included with seismic hazards in Section 3.11, “Geology, Soils, Land Capability, and Coverage.”

3.9.1 Regulatory Setting

FEDERAL

Regulated Floodplain

Executive Order (EO) 11988 (Floodplain Management) directs all federal agencies to refrain from conducting, supporting, or allowing actions in floodplains unless it is the only practicable alternative. The Federal Highway Administration (FHWA) requirements for compliance are outlined in 23 Code of Federal Regulations (CFR) 650 Subpart A.

To comply, the following must be analyzed:

- ▲ the practicability of alternatives to any longitudinal encroachments,
- ▲ risks of the action,
- ▲ impacts on natural and beneficial floodplain values,
- ▲ support of incompatible floodplain development, and
- ▲ measures to minimize floodplain impacts and to preserve/restore any beneficial floodplain values affected by the project.

The base floodplain is defined as “the area subject to flooding by the flood or tide having a one percent chance of being exceeded in any given year.” An encroachment is defined as “an action within the limits of the base floodplain.”

Federal Emergency Management Agency

The Federal Emergency Management Agency (FEMA) oversees federal floodplain management policies and runs the National Flood Insurance Program (NFIP) adopted under the National Flood Insurance Act of 1968. FEMA prepares Flood Insurance Rate Maps (FIRM) that delineate the regulatory floodplain to assist local governments with land use and floodplain management decisions to meet the requirements of the NFIP. In general, the NFIP mandates that development is not to proceed within the regulatory 100-year floodplain, if the development is expected to increase flood elevation by one foot or more. Very limited development is allowed in designated 100-year floodways (i.e., flood flow channels and areas with sufficient directional flow velocity of 100-year floodwaters).

TAHOE REGIONAL PLANNING AGENCY

Lake Tahoe Regional Plan

The two components of the Lake Tahoe Regional Plan that address policies and regulations pertaining to hydrology and floodplains are the Goals and Policies and the Code of Ordinances.

Goals and Policies

Goals and policies applicable to hydrology and floodplains are included in the Natural Hazards Subelement of the Goals and Policies document of the Regional Plan. The Natural Hazards Subelement addresses risks from natural hazards (e.g., flood, fire, avalanche, and earthquake). Specifically, Goal 1, Policy 2 prohibits new construction on, or disturbance of land within the 100-year floodplain and in the area of wave run-up, except as necessary to implement the goals and policies of the Plan. It also requires all public utilities, transportation facilities, and other necessary public uses located in the 100-year floodplain and area of wave run-up to be constructed or maintained to prevent damage from flooding and to not cause flooding.

Code of Ordinances

Chapter 35 of 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 relies on FEMA and U.S. Army Corps of Engineers (USACE) 100-year floodplain delineations; however, in areas where no floodplain has been previously delineated and TRPA has reason to believe that a flood hazard may exist, TRPA may require a site-specific floodplain evaluation completed by a qualified professional (TRPA Code Section 35.4.1.D).

STATE

No California or Nevada state regulations related to hydrology and floodplains are applicable to the alternatives evaluated in this EIR/EIS/EIS.

LOCAL

Because there are no floodplains on the California side of the study area, local regulations from California jurisdictions that pertain to floodplains are not described in this section. Provisions from Nevada jurisdictions are described below.

Douglas County Master Plan

The 15-year update of the Douglas County Master Plan was adopted on March 1, 2012. This update included the adoption of the South Shore Area Plan (SSAP), which incorporated the relevant TRPA Regional Plan updates into the Douglas County Code and Douglas County Master Plan. The Environmental Resources and Conservation Element Goal 3 is to provide the residents of Douglas County with increased protection from flooding (Douglas County 2012).

Douglas County Floodplain Management Code

Section 20.50 of the Douglas County Code provides regulations pertinent to floodplain management and development within flood areas. Section 20.50.100 requires that all projects with construction on a parcel with any portion within a special flood hazard area must obtain a floodplain development permit. This permit includes a survey by a licensed engineer detailing the floodplain boundaries on the parcel, an elevation certificate, and proof that the proposed construction does not encroach into the special flood hazard area. If the project cannot avoid the special flood hazard area, the applicant must include a hydrology and hydraulics study to demonstrate that the project will not increase the water surface of the base flood elevation (BFE) by more than one foot at any point within the community (Section 20.50.160). If the project would change the BFE by more than 0.5 feet, the applicant must obtain a Conditional Letter of Map Revision from FEMA (Douglas County 2016).

3.9.2 Affected Environment

REGIONAL HYDROLOGY

The project is located within the southern portion of the Lake Tahoe Hydrologic Unit. The project site straddles the southern California/Nevada border and is located at the base of the Bijou Park and Edgewood Creek watersheds, as delineated by TRPA. Exhibit 3.9-1 shows the watersheds, drainages, and floodplains within the study area and just beyond.

The total area of the Edgewood Creek watershed is 4,270 acres, with approximately 4,010 acres located above the project site and 160 acres below. Edgewood Creek is one of 63 streams that drain into Lake Tahoe. Major land uses within the Edgewood Creek watershed include state park and federal forest land, residential neighborhoods, commercial areas, a portion of Heavenly Mountain Resort, the Stateline casino core area, and the Edgewood Tahoe Golf Course.

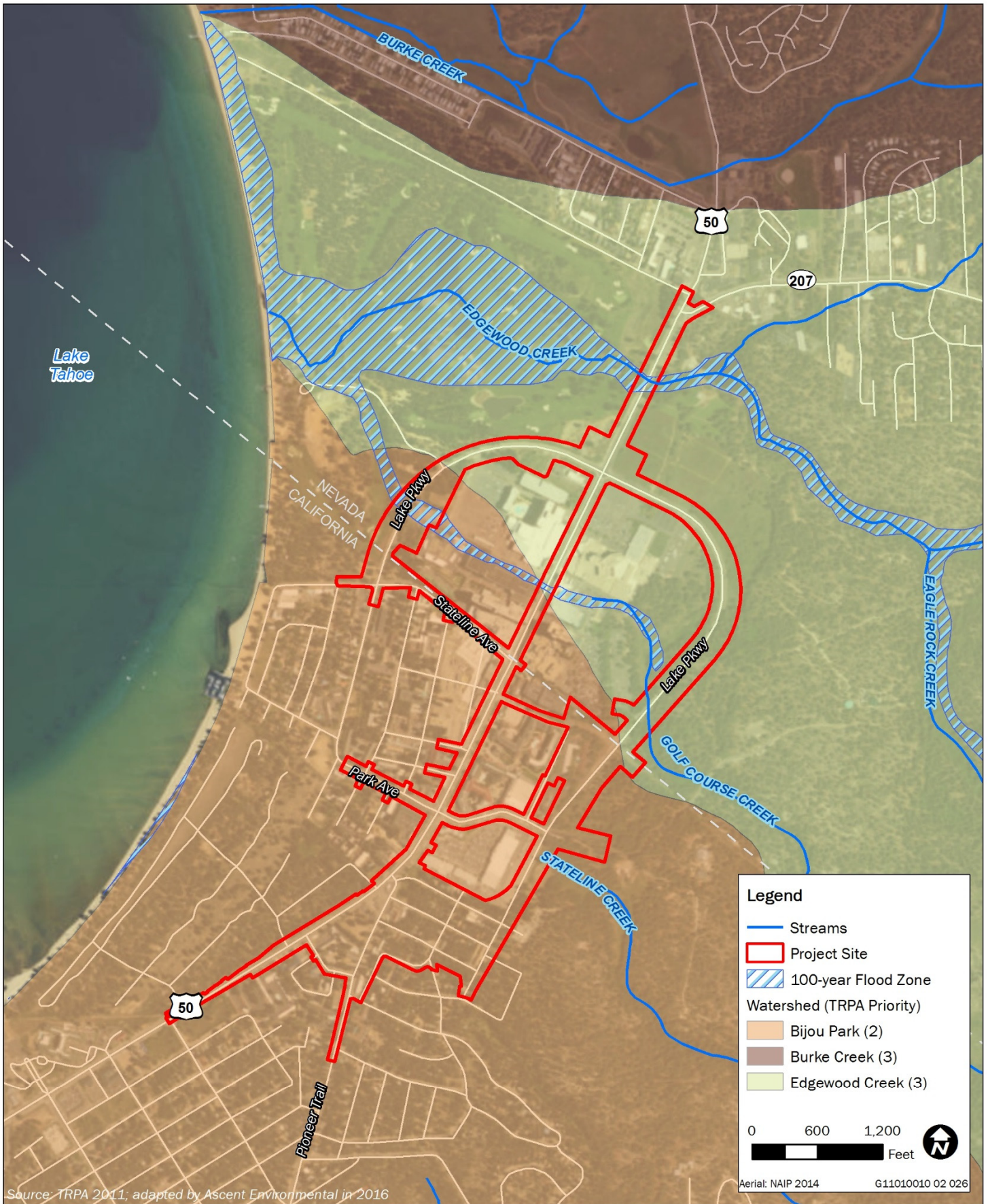
Bijou Park watershed encompasses approximately 1,980 acres and includes Stateline Creek and Little Heavenly Creek, both of which terminate in meadow areas and do not directly drain into Lake Tahoe. Major land uses within this watershed include Heavenly Mountain Resort, residential neighborhoods, state park and federal forest land, commercial areas, and the Ski Run Marina.

LOCAL HYDROLOGY

The primary aquatic feature in the study area is Edgewood Creek. Edgewood Creek is a perennial stream that is located at the north end of the project site. Flowing east to west, the stream passes under US 50 and ultimately discharges into Lake Tahoe. Edgewood Creek supports a relatively well developed riparian canopy upstream of US 50; however, downstream of US 50 the creek flows through the Edgewood Tahoe Golf Course and, as a result, has been substantially modified. The flow of Edgewood Creek is controlled by a gate structure in Friday Station Pond, which is located approximately 500 feet upstream of the US 50 crossing. Below US 50, the creek flows through a series of constructed ponds, which provide irrigation water to the golf course.

The study area also contains two smaller drainages, Golf Course Creek and Stateline Creek. Golf Course Creek is an intermittent drainage located in Nevada, and crosses Lake Parkway approximately 400 feet north of the state line. Two small forks of the creek converge immediately east of Lake Parkway, flow under the road via a corrugated metal pipe (CMP) culvert, and through a montane meadow before flowing into underground drains near the north end of the Harrah's parking lot. Golf Course Creek was culverted through the Stateline resort-casino area, where flow from the stream is comingled with stormwater runoff from the resort-casino area in underground vaults. A diversion structure located between the Harvey's and the Hard Rock properties diverts approximately 10 percent of the piped flow to Golf Course Creek and 90 percent of the flow to the Common Stormwater Treatment Facilities associated with the Stateline Stormwater Association (SSWA) treatment system described in detail in Section 3.10, Water Quality and Stormwater Runoff. Flows directed to Golf Course Creek daylight in an earthen ditch that runs adjacent to the cart path on golf hole number eight at Edgewood Tahoe Golf Course, and merge with Edgewood creek near the Edgewood Clubhouse. Stateline Creek is an ephemeral drainage that intersects with US 50 approximately 1,200 feet south of the state line. It serves as a conduit for snow melt and runoff and supports the meadow complex south of the Van Sickle Bi-State Park entrance.

The Natural Environment Study for the project (TTD 2015a) identifies several potential wetlands within the study area. The largest of these are two features located around Golf Course Creek on either side its intersection with Lake Parkway. Another small potential wetland was mapped on the margins of Edgewood Creek at its intersection with US 50. The remaining potential wetlands are associated with roadside drainage along Lake Parkway and US 50. In total, 0.89 acres of potential wetlands were mapped within the project's study area. Descriptions of wetlands in the project site and effects on wetlands are also addressed in Section 3.16, "Biological Environment."



Source: TRPA 2011; adapted by Ascent Environmental in 2016

Exhibit 3.9-1

Watersheds, Drainages, and Floodplains

FLOODPLAINS

Exhibit 3.9-1 shows the two locations within the study area that are mapped as 100-year flood zone, which is defined by the FEMA Special Flood Hazard Area Zone A (also known as 100-year floodplain). Both areas are located within the Nevada portion of the study area: the US 50 crossing of Edgewood Creek and the Lake Parkway crossing of Golf Course Creek. FEMA has not established base flood elevations or flood depths for either of these areas. The project site is located within FEMA FIRM panels 32005C0210G (January 20, 2010), 32005C0205G (January 20, 2010), and 06017C0380F (April 3, 2012). A third location in the study area mapped as 100-year flood zone is the Golf Course Creek crossing of US 50. While this area is identified on the FEMA map, this part of the creek has been covered by development.

3.9.3 Environmental Consequences

METHODS AND ASSUMPTIONS

Evaluation of potential hydrologic and floodplain impacts is based on a review of documents pertaining to the project site, including the FEMA Flood Insurance Rate Maps; previous studies conducted for the watersheds within the study area; 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 thresholds of significance. In determining the level of significance, the analysis assumes that the project would comply with relevant federal, state, and local laws, regulations, and ordinances.

SIGNIFICANCE CRITERIA

NEPA Criteria

An environmental document prepared to comply with NEPA must consider the context and intensity of the environmental effects that would be caused by or result from the locally preferred action. Under NEPA, the significance of an effect is used solely to determine whether an EIS must be prepared. The factors that are taken into account under NEPA to determine the significance of an action in terms of the context and the intensity of its effects are encompassed by the CEQA criteria used for this analysis. No specific factors related to hydrology and floodplains are contained in NEPA, CEQ Regulations Implementing NEPA, or FHWA NEPA regulations in 23 CFR 771 et seq.

Executive Order 11988 requires federal agencies to avoid to the extent possible the long-term and short-term adverse impacts associated with the occupancy and modification of flood plains and to avoid direct and indirect support of floodplain development wherever there is a practicable alternative.

TRPA Criteria

The “Water Quality” criteria from the TRPA Initial Environmental Checklist include questions regarding hydrology and flooding, so they are used to evaluate impacts of the alternatives. The project would result in a significant adverse impact if it would result in:

- ▲ alterations to the course or flow of 100-year flood waters; or
- ▲ exposure of people or property to water related hazards such as flooding and/or wave action from 100-year storm occurrence.

CEQA Criteria

In accordance with Appendix G of the State CEQA Guidelines, an alternative was determined to result in a significant impact to hydrology or floodplains, if it would:

- ▲ place within a 100-year flood hazard area structures that would impede or redirect flood flows; or
- ▲ expose people or structures to a significant risk of loss, injury, or death involving flooding.

ENVIRONMENTAL EFFECTS OF THE PROJECT ALTERNATIVES

Impact 3.9-1: 100-year flood hazard and floodplain impacts

Alternatives B, C, and D would require the extension of the US 50 culvert over Edgewood Creek and the Lake Parkway culvert over Golf Course Creek. This expansion would result in an encroachment into the 100-year floodplain of both streams; however, compliance with the Douglas County Floodplain Development Permit would require that the encroachment would not result in an increase in the Base Flood Elevation and would not adversely affect the direction or velocity of flood waters.

NEPA Environmental Consequences: The design features of Alternatives B, C, D, and E would avoid or minimize significant encroachment into the 100-year floodplain of any waterbody; No Impact for Alternative A

CEQA/TRPA Impact Determinations: Less Than Significant for Alternatives B, C, D, and E; No Impact for Alternative A

The project crosses the 100-year floodplain of Edgewood and Golf Course Creeks. Both of these streams are low volume drainages with culverts that do not show evidence of lack of conveyance. Additionally, and there is no history of flooding at either location (TTD 2015b). The project would widen and restructure existing roadways to better accommodate traffic volumes and improve pedestrian safety, but would not place housing or structures within the flood zones. The proposed roadway widening (in Alternatives B, C, and D) would require encroachment into the designated 100-year flood hazard area zone of both creeks.

Development that reduces the volume of a 100-year floodplain or alters the direction, rate, or speed of 100-year floodwaters would be considered a significant impact. Floodplain encroachment is categorized in two ways: longitudinal encroachment and transverse encroachment. Longitudinal encroachment (parallel) occurs when a structure crosses a portion of the floodplain outside of the channel. Transverse encroachment (perpendicular) occurs when a structure crosses both the floodplain and the channel. Transverse encroachment would occur at two locations within the Nevada portion of the project site for Alternatives B, C, and D: at the Edgewood Creek crossing of US 50; and the tributary to Edgewood Creek through Lake Parkway and US 50. Alternatives A (No Build/No Project) and E (Skywalk) would not result in any floodplain encroachments. Table 3.9-1 provides the square feet of potential floodplain encroachment for each alternative.

Table 3.9-1 Potential Floodplain Encroachment by Alternative

Alternative	Edgewood Creek	Golf Course Creek	Total
A	No Build/No Project		
B	0.16 acres	0.22 acres	0.38 acres
C	0.30 acres	0.22 acres	0.52 acres
D	0.16 acres	0.22 acres	0.38 acres
E	No impact		

Source: FEMA 2010a, FEMA 2010b

Alternative A: No Build (No Project)

Under Alternative A, no highway realignment would take place and no additional floodplain impacts would occur at Edgewood or Golf Course Creeks. Therefore, Alternative A would have **no impact** relative to 100-year flood hazards or floodplain impacts for the purposes of NEPA, CEQA, and TRPA.

Alternative B: Triangle (Locally Preferred Action)

Transportation Improvements

Edgewood Creek currently passes under US 50 through a culvert. For Alternative B, the existing culvert would be lengthened by approximately 15 feet to accommodate the wider roadway. The project would result in the encroachment of construction onto 0.16 acres of land within the 100-year floodplain at Edgewood Creek. No potential replacement housing areas are located within 100-year floodplains.

The proposed Lake Parkway East crossing at Golf Course Creek would be widened; however, this portion of the stream is located outside of the FEMA delineated floodplain (FEMA 2010b). Encroachment into approximately 0.22 acres of the FEMA-delineated Golf Course Creek 100-year floodplain would occur with the Alternative B widening at Lake Parkway West and the existing alignment of US 50 (refer to Exhibit 3.11-1). Golf Course Creek has been piped beneath the casino core in these locations and project-related disturbances such as restriping or repaving the roadways would not alter the course of flow of 100-year flood waters.

The potential for the project to significantly alter the 100-year floodplain would be avoided through compliance with the Douglas County Floodplain Management Code. As required by Section 20.50.100 of the Douglas County Code, the county would require a Floodplain Development Permit, including a floodplain survey completed by a licensed engineer delineation the floodplain boundaries on all affected parcels, as well as an elevation certification and proof that the project would not encroach into the special flood hazard area. If this survey shows that the project would encroach into the special flood hazard area, the applicant must also submit a hydrology and hydraulics study that demonstrates the project would not create an increase in the BFE of more than 1 foot. If this study shows that the project would increase the BFE by more than 0.5 feet, the applicant would be required to obtain a Conditional Letter of Map Revision from FEMA (Douglas County 2016).

Although the project would create new encroachment within the 100-year floodplain of two creeks, the Douglas County code provides protective conditions that would avoid the potential for a significant adverse impact to people and properties, and require that Alternative B would not result in a substantial increase in the BFE of Edgewood or Golf Course Creeks. Through compliance with these conditions, the potential for Alternative B to adversely alter the course, level, or flow of 100-year flood waters would be **less than significant** for the purposes of CEQA and TRPA.

For the purposes of NEPA, the design features of the transportation improvements included in Alternative B would not result in a significant encroachment on a floodplain such that no additional mitigation measures are needed or feasible to implement.

Mixed-Use Development including Replacement Housing

The locations of the three mixed-use development sites are outside of the 100-year floodplains. Because the Alternative B mixed-use development sites would not alter existing floodplain conditions, the mixed-use development sites would have **no impact** relative to 100-year flood hazards and floodplains for the purposes of CEQA, TRPA, and NEPA.

Construction of replacement housing at a location other than the three mixed-use development sites could result in similar potential for significant encroachment on a floodplain as described for the mixed-use development sites. However, because the location of replacement housing elsewhere is unknown, analysis of floodplain encroachment at another location would be speculative at this time. Full, project-level environmental review of replacement housing somewhere other than the mixed-use development sites would be required prior to construction of replacement housing and displacement of existing residents.

Conclusion

For the purposes of CEQA and TRPA, taken as a whole, the Alternative B transportation improvements and mixed-use development, including replacement housing, would result in a **less-than-significant** impact on floodplains.

For the purposes of NEPA, the design features of the transportation improvements and the mixed-use development sites as part of Alternative B would minimize the floodplain impacts such that no additional mitigation measures are needed or feasible to implement.

Alternative C: Triangle One-Way**Transportation Improvements**

Alternative C would encroach into a greater area of the 100-year floodplain when compared to Alternative B. Alternative C would result in an encroachment into 0.30 acres of 100-year floodplain at Edgewood Creek, which exceeds the Alternative B encroachment by 0.14 acres. Like Alternative B, Alternative C would encroach into approximately 0.22 acres of the Golf Course Creek floodplain. As described above for Alternative B, any project that proposes to alter the 100-year floodplain would be required to complete a Floodplain Development Permit in accordance with Douglas County Code Section 20.50. Prior to permit approval, the project would be required to demonstrate that the proposed floodplain encroachment would not create an increase in the BFE of more than 1 foot. For the reasons described above for Alternative B, implementation of Alternative C would have a **less-than-significant** impact relative to 100-year flood hazards and floodplains for the purposes of CEQA and TRPA.

For the purposes of NEPA, the design features of the transportation improvements included in Alternative C would not result in a significant encroachment on a floodplain such that no additional mitigation measures are needed or feasible to implement.

Mixed-Use Development including Replacement Housing

The locations of the mixed-use development sites are outside of the 100-year floodplains. Because the Alternative C mixed-use development sites would not alter existing floodplain conditions, the mixed-use development sites would have **no impact** relative to 100-year flood hazards and floodplains for the purposes of CEQA, TRPA, and NEPA.

Construction of replacement housing at a location other than the three mixed-use development sites could result in similar potential for significant encroachment on a floodplain as described for the mixed-use development sites. However, because the location of replacement housing elsewhere is unknown, analysis of floodplain encroachment at another location would be speculative at this time. Full, project-level environmental review of replacement housing somewhere other than the mixed-use development sites would be required prior to construction of replacement housing and displacement of existing residents.

Conclusion

For the purposes of CEQA and TRPA, taken as a whole, the Alternative C transportation improvements and mixed-use development, including replacement housing, would result in a **less-than-significant** impact on floodplains.

For the purposes of NEPA, the design features of the transportation improvements and the mixed-use development sites as part of Alternative C would minimize the floodplain impacts such that no additional mitigation measures are needed or feasible to implement.

Alternative D: Project Study Report Alternative 2**Transportation Improvements**

The potential floodplain impacts of Alternative D are similar to those described for Alternative B above. Alternative D would include encroachment into approximately 0.16 acres of 100-year floodplain at Edgewood Creek and 0.22 acres of 100-year floodplain at Golf Course Creek, because of proposed road

widenings at the creek crossings. As described above for Alternative B, any project that alters the 100-year floodplain would be required to complete a Floodplain Development Permit in accordance with Douglas County Code Section 20.50. Prior to permit approval, the project would be required to demonstrate that the proposed floodplain encroachment would not create an increase in the BFE of more than 1 foot.

For the reasons described above for Alternative B, implementation of Alternative D would have a **less-than-significant** impact relative to 100-year flood hazards and floodplains for the purposes of CEQA and TRPA.

For the purposes of NEPA, the design features of the transportation improvements included in Alternative D would not result in a significant encroachment on a floodplain such that no additional mitigation measures are needed or feasible to implement.

Mixed-Use Development including Replacement Housing

The locations of the mixed-use development sites are outside of the 100-year floodplains. Because the Alternative D mixed-use development sites would not alter existing floodplain conditions, the mixed-use development sites would have **no impact** relative to 100-year flood hazards and floodplains for the purposes of CEQA, TRPA, and NEPA.

Construction of replacement housing at a location other than the three mixed-use development sites could result in similar potential for significant encroachment on a floodplain as described for the mixed-use development sites. However, because the location of replacement housing elsewhere is unknown, analysis of floodplain encroachment at another location would be speculative at this time. Full, project-level environmental review of replacement housing somewhere other than the mixed-use development sites would be required prior to construction of replacement housing and displacement of existing residents.

Conclusion

For the purposes of CEQA and TRPA, taken as a whole, the Alternative D transportation improvements and mixed-use development including replacement housing would result in a **less-than-significant** impact on floodplains.

For the purposes of NEPA, the design features of the transportation improvements and the mixed-use development sites as part of Alternative D would minimize the floodplain impacts such that no additional mitigation measures are needed or feasible to implement.

Alternative E: Skywalk

No portion of the Alternative E construction would be located within a 100-year floodplain. Because Alternative E would not alter existing floodplain conditions, this alternative would have **no impact** relative to 100-year flood hazards and floodplains for the purposes of CEQA, TRPA, and NEPA.

3.9.4 Avoidance, Minimization, and/or Mitigation Measures

No avoidance, minimization, or mitigation measures are required to reduce hydrological or floodplain effects to a less-than-significant level for the purposes of CEQA and TRPA or to no significant encroachment for the purposes of NEPA.

This page intentionally left blank.