

4.8 HYDROLOGY AND WATER QUALITY

4.8.1 Introduction

This section provides the environmental and regulatory background necessary to analyze the impacts of the proposed Dry Creek Greenway East Trail project to hydrology and water quality. Sources of information used to evaluate impacts include: project specific hydrologic and engineering reports, regulatory documents, and existing planning and water quality documents for the surrounding area.

Comments received on the Notice of Preparation for the EIR addressed potential downstream effects from creek bank work, rainwater drainage runoff, maintaining floodway channel capacity, obtaining Flood Protection Board permits, and the potential for hydraulic impacts. These issues are addressed in the impact discussions in this section.

4.8.2 Environmental Setting

REGIONAL HYDROLOGY

The project area is located within the Dry Creek watershed, which covers approximately 101 square miles in Placer and Sacramento Counties and is part of the larger Sacramento River Basin. The Cities of Rocklin and Roseville and the Town of Loomis are wholly or partially contained within the watershed. The headwaters of Dry Creek are located in the upper portions of the Loomis Basin in the vicinity of Penryn and Newcastle at elevations of 900 to 1,200 feet above mean sea level (msl) (Placer County Flood Control and Water Conservation District [PCFCWCD] 2011). The mouth of Dry Creek at its confluence with Steelhead Creek, which connects to the Sacramento River, is at an elevation of approximately about 30 feet above msl (Placer County 2005). Antelope Creek and Clover Valley Creek form the northwestern boundary of the watershed, and Secret Creek and Miners Ravine comprise the northeast portion of the watershed. Antelope Creek, Secret Ravine, and Miners Ravine converge near Interstate 80 (I-80) to form Dry Creek. Cirby Creek, made up of the combination of Cirby and Linda Creeks and Strap Ravine, joins Dry Creek just upstream from Riverside Avenue in Roseville.

Land use within the watershed has changed from rural to urban. Urban development led to increased impervious areas, reduced riparian vegetation, channelization, structures that impede flows, and reduction of the natural floodplain (Placer County 2003). The total percentage of impervious surfaces within the watershed increased from 16.2 percent in 1992 to 19.9 percent in 2007 and is projected to reach 24.8 percent at build out (PCFCWCD 2011). The amount of impervious surfaces within a watershed is directly linked to stormwater runoff rates and volumes.

LOCAL HYDROLOGY

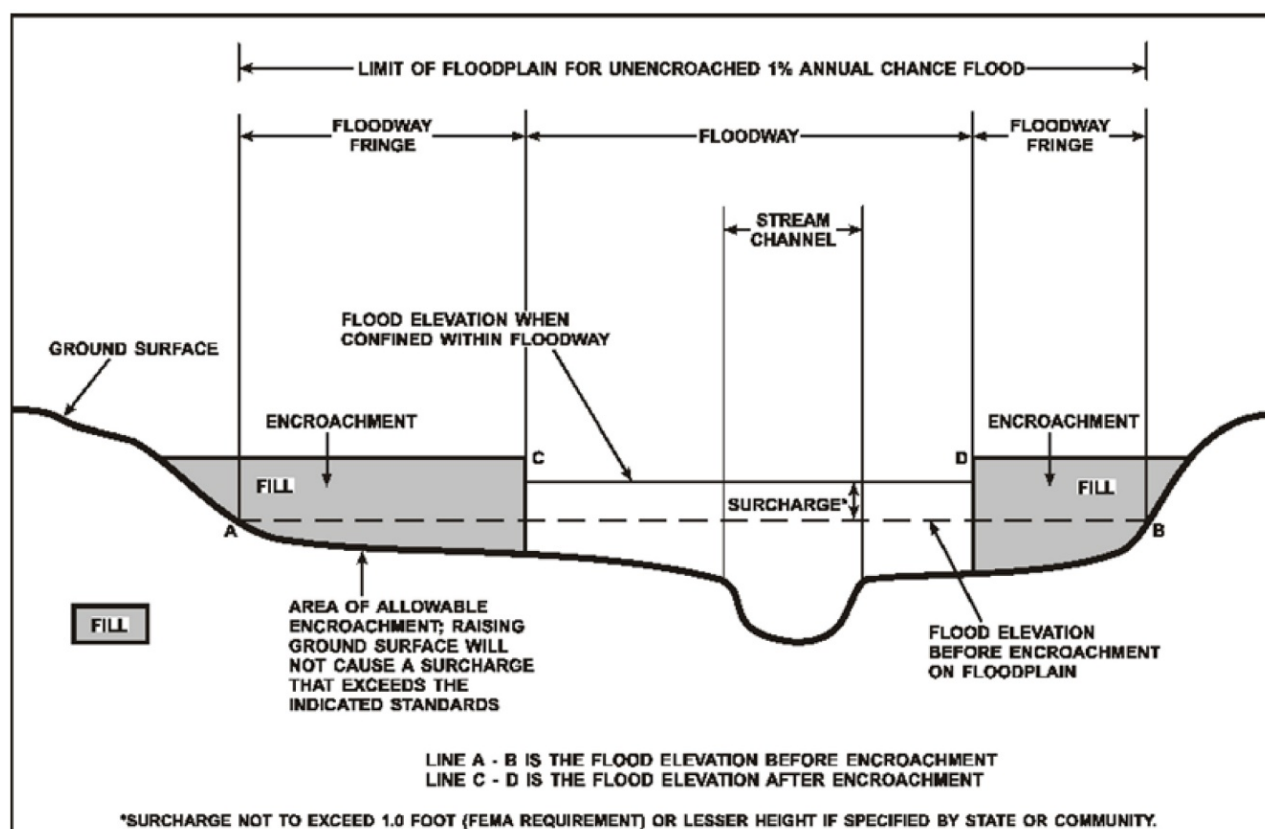
The project area is located in the Lower American hydrologic unit (HUC 18020111) within the Dry Creek watershed. The project area encompasses portions of Strap Ravine, Linda Creek, Cirby Creek, and Dry Creek. Linda Creek flows in a generally northwest direction towards Cirby Creek. Strap Ravine is a seasonal tributary to Linda Creek located north of the creek in the section between Rocky Ridge Drive and Champion Oaks Drive. The confluence of Linda Creek and Cirby Creek is located west of Sunrise and east of I-80, and Cirby Creek discharges into Dry Creek east of Riverside Avenue. All three main creek corridors are urban creeks and receive flows from adjacent development through culverts from the City storm drain system, sheet flow from adjacent riparian areas, and runoff from residential yards.

REGULATED FLOODPLAINS

The Dry Creek watershed is one of the four primary sources of flooding within Placer County (Placer County 2005). Dry Creek and its tributaries have an extensive record of historic flood, especially in the Roseville area. Damaging floods occurred in December 1955, April 1958, October 1962, December 1964, March 1983, February 1986, January 1995, January 1997, and January 2011. The floods of 1983, 1986, and 1995 were the largest and most damaging on record (Placer County 2005).

The one-percent annual chance (“100-year”) floodplain is composed of two key components: the floodway and the floodway fringe (see Exhibit 4.8-1). The floodway fringe is the perimeter of the floodplain and is an area where development may be allowed provided that it does not raise the base flood elevation by more than one foot. The floodway is a fictitious boundary which marks the limit of a hypothetical channel that could hold the 100-year flood flows if the floodway fringe areas were developed. Within the floodway, development or disturbance can only be permitted if it does not result in any increase in the base flood elevation.

The Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRM) (06061C0479G, 06061C0478F, and 06061C0487F and Preliminary Digital FIRMs 06061C1031H, 06061C1032H, and 06061C1051H) and the City of Roseville (City) have mapped flood hazard zones in the City. Their flood zone dataset indicate that the project area is almost entirely located within the 100-year floodplain of Dry Creek, Cirby Creek, and Linda Creek. The 100-year floodplain refers to the area that is inundated by a flood that has a one percent chance in any given year of being equaled or exceeded. The 100-year flood is the national minimum standard to which communities regulate their floodplains. In general, the FIRM maps are developed for watersheds one square mile or larger (640 acres). The City developed its own flood hazard maps to inform planning decisions. These maps include 100-year flood zones for watersheds of 300 acres or larger (City of Roseville 2014). The FEMA FIRM and City of Roseville 100-year flood zones within the project area are shown on Exhibit 4.8-2.



Source: FEMA 2017

X11010072.01.018

Exhibit 4.8-1 Regulatory Components of the 100-year Floodplain

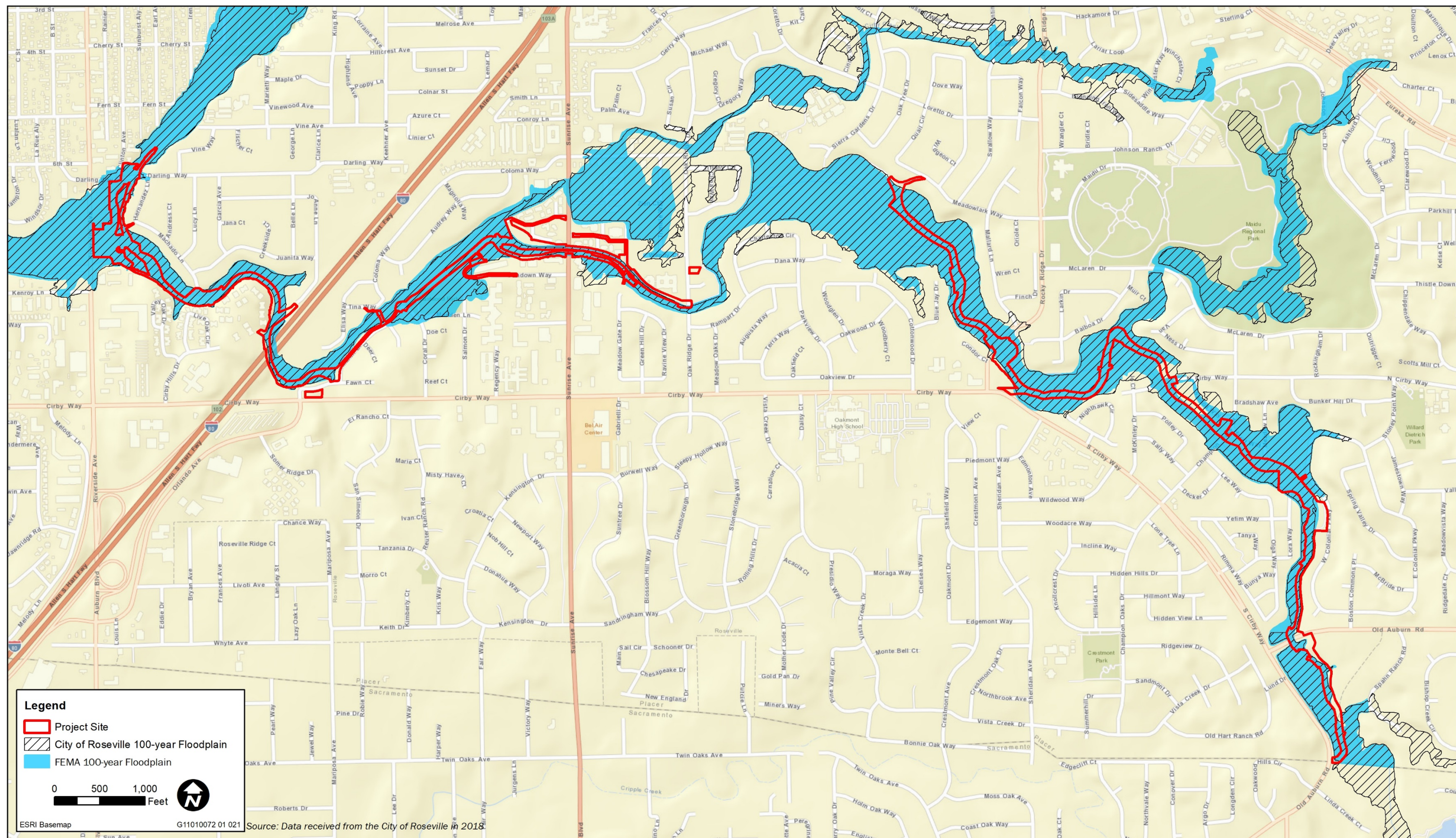


Exhibit 4.8-2

FEMA FIRM and City of Roseville 100-year Flood Hazard Zones

In addition to 100-year floodplains, the City of Roseville has mapped 200-year floodplains in relevant urban areas, as required by the Central Valley Flood Protection Act of 2008. Within the 200-year floodplain, habitable structures must be elevated to avoid flood hazards and bridges must be designed to provide a minimum of two feet of clearance above the design flood water surface (see section 4.8.3, “Regulatory Setting” for additional discussion).

The City is involved in several flood control projects and mitigation programs designed to protect residents and lessen the potential for flooding both within the City and within neighboring communities. These projects include constructing flood control improvements, removing restrictive structures in the floodplain, collecting drainage mitigation fees to alleviate downstream damage, development of a flood alert system, and a stream cleaning program in flood prone areas (COR 2014).

Jurisdictional Waters of the United States

A delineation of Jurisdictional Waters of the United States was completed by Ascent Environmental in April and June of 2014. This delineation will be submitted to the U.S. Army Corps of Engineers (USACE) for verification during the permitting phase of the project. Waters of the United States include essentially all navigable waters (waters used for transport or commerce) and their tributaries, all interstate waters and their tributaries, wetlands with a clear connection to these waters, and all impoundments of these waters. The USACE distinguishes between wetland and non-wetland waters (commonly referred to as “other waters”). Wetlands are defined as areas that are inundated or saturated by surface or groundwater for a sufficient duration to support a prevalence of vegetation adapted for life in saturated soil conditions (Title 33 CFR Section 328.3[b]).

The wetland delineation for the project site identified two wetlands. Other waters of the United States included portions of Strap Ravine, Linda Creek, Cirby Creek, Dry Creek, two unnamed perennial streams, an intermittent drainage, and an ephemeral drainage (Ascent Environmental 2015). Table 4.8-1 provides the acreage and linear feet of potential jurisdictional waters within the project site.

Table 4.8-1 Potentially Jurisdictional Wetlands and Other Waters within the Project Site

Type	Acres	Linear Feet
Other Waters		
Ephemeral Drainage	0.002	51
Intermittent Drainage	0.05	144
Perennial Stream	3.91	5,025
Drainage	0.02	164
Total Other Waters	3.982	5,384
Wetlands		
Wetland	0.01	NA
Freshwater Pond	0.11	NA
Total Wetlands	0.12	NA
Total Wetlands and Other Waters	4.1	5,384

Source: Ascent Environmental 2015

Surface Water Quality

Urbanization of the Dry Creek Watershed has had a major effect on both short- and long-term water quality within the project area. Increasing development has resulted in an increase in impervious surfaces such as roofs, streets, sidewalks, and storm drains. These combine to decrease infiltration opportunities and (depending upon soil type) may increase the volume and rate of run-off. Increased

run-off velocity adds to the potential for channel erosion resulting in increased sediment into the watercourses. In addition, sediment deposited in streams from construction-related activities results in degradation of spawning, rearing, and food producing habitat for wildlife. Removal of riparian vegetation can result in effects such as increasing stream temperature and reducing the input of biologic materials into the streams.

Long-term impacts to water quality occur as a result of run-off from urbanization that enters the watercourses. Reduction in permeable surface areas limits the percolation and associated filtration processes beneficial to water quality. Urban run-off from surfaces such as streets, parking lots, driveways, and landscaped areas typically includes oil, grease, heavy metals, pesticides, herbicides, fertilizers, and sediments. Increases in urban run-off have been shown to impact, among other things, aquatic habitat.

Two locations along Dry Creek and Cirby Creek were monitored for surface water quality in 2008, 2009, and twice in 2010 as part of the Central Valley RWQCB's Safe-to-Swim program. Monitoring sites were sampled for *E. coli*, nutrients, and *Salmonella* (Central Valley Regional Water Quality Control Board [Central Valley RWQCB] 2009). During September of 2008 and 2010, the monitoring site at the confluence of Dry Creek and Cirby Creek exceeded the EPA *E. coli* limit for contact recreation (Central Valley RWQCB 2008 and 2010a). High levels of *E. coli* were also found at Dry Creek near Royer Park in June 2010 (Central Valley RWQCB 2010b) and at Linda Creek at Oak Ridge Drive in September 2010 (Central Valley RWQCB 2010a). In almost all cases, the temperature readings at sample points exceeded the $\leq 20^{\circ}\text{C}$ water quality objective for surface water entering the Bay Delta. A warm, stagnant waterbody with readily available nutrients provides a favorable environment for the growth of bacteria, and it is possible that as flows decrease in Cirby Creek over the dry season, bacteria levels increase and contribute to the elevated levels of *E. coli* measured at the Dry Creek/Cirby Creek confluence (Central Valley RWQCB 2009). Additional monitoring data from the USEPA STOREST database indicates that during the summer months, dissolved oxygen levels in Dry Creek, Cirby Creek, and Linda Creek fall below the 7.0 mg/L threshold for cold water habitats (PSOMAS 2015a).

Groundwater

The project site is located within the North American (River) Groundwater Sub-Basin, within the larger Sacramento Valley Groundwater Basin (Placer County Water Agency [PCWA] 2007). The eastern sub-basin boundary is a north-south line extending from the Bear River south to Folsom Reservoir. This line represents the approximate edge of the alluvial basin where little or no groundwater flows into or out of the groundwater basin from the Sierra Nevada. The western portion of the sub-basin consists of nearly flat flood basin deposits from the Bear, Feather, Sacramento, and American Rivers, and several small east side tributaries (PCWA 2007). The water bearing geologic deposits within the North American Sub-Basin consists of an upper unconfined and moderately permeable aquifer system made up of the Riverbank and Turlock Lake/Laguna formations, and a lower semi-confined aquifer system composed primarily of the Mehrten Formation (PCWA 2007). These formations consist of lenses of sand, silt, and clay inter-bedded with coarse grained stream channel deposits that store water. They form a wedge that generally thickens from the east, where the Mehrten formation is at or near the ground surface, to the west, where it is buried more than 1,000 feet below the upper aquifer. Beneath the City of Roseville, the top of the Mehrten Formation can be found at approximately 300 feet below the ground surface (Petersen 2005).

Groundwater is not a large component of the Dry Creek Watershed supply and does not affect surface water resources. In fact, the portion of the watershed within the project area is in the groundwater recharge zone; an area where surface waters infiltrate into the soil to recharge underlying groundwater resources (Placer County 2003). Groundwater supplies are naturally recharged by rainwater that reaches the subsurface saturated zone of the soil. The rate and quantity of water reaching the saturation zone depends on factors that include the amount and duration of precipitation, soil type, moisture content of the soil, and vertical permeability of the unsaturated zone. Urbanization of the Roseville area has increased the amount of impervious surfaces and limited the areas where natural

recharge can take place. In general, the primary locations for groundwater recharge are along the City's major watercourses, including Dry, Cirby, and Linda Creeks. The highly permeable stream deposits along these creeks provide groundwater storage in the upper 0 to 100 feet, which can gradually move lower and recharge the semi-confined upper aquifer.

Soils

In the project area, the soils within and adjacent to the stream channels are known as Xerofluvents. These soils are composed of moderately well drained to poorly drained loamy alluvium, which are regularly shifted and repositioned by flowing water. The Natural Resources Conservation Service (NRCS) soil survey for the project site states that these soils have high to moderate infiltration rates and an Erosion Hazard Rating of "slight" (NRCS 2015). This rating means that erosion would be unlikely under normal conditions when 50 to 75 percent of the soil surface has been exposed by some kind of disturbance. These soils make up approximately 89 percent of the project site. Outside of the active alluvial area, the soils transition to well drained loams and sandy loams, the majority of which are underlain by consolidated sandstone or siltstone.

4.8.3 Regulatory Setting

Hydrologic resources are protected and/or regulated by a variety of federal, state, and local laws and policies. Key regulatory and conservation planning issues applicable to the proposed project are discussed below.

FEDERAL

Clean Water Act

The Clean Water Act (CWA) is the primary federal legislation governing water quality whose objective is "to restore and maintain the chemical, physical, and biological integrity of the nation's waters," which includes oceans, bays, rivers, lakes, ponds, and wetlands.

In 1972, the CWA was amended to require National Pollutant Discharge Elimination System (NPDES) permits for discharge of pollutant in "waters of the United States." The CWA was amended in 1987 to require that EPA establish regulations for permitting under the NPDES program of municipal and industrial stormwater discharges. The EPA published final regulations regarding stormwater discharges on November 16, 1990. The EPA regulations require that Municipal Separate Storm Water Sewer System (MS4) discharges to surface waters be regulated by an NPDES permit.

In addition, the CWA requires states to adopt water quality standards for water bodies and have those standards approved by the EPA. Water quality standards consist of designated beneficial uses (e.g., wildlife habitat, agricultural supply, fishing) for a particular water body along with water quality criteria necessary to support those uses. Water quality criteria are prescribed concentrations or levels of contaminants (e.g., lead, suspended sediment, and fecal coliform bacteria) or narrative statements that represent the quality of water that supports a particular use.

The State Water Resources Control Board (SWRCB) identifies waters of the state that do not meet water quality criteria and places them on the 303 (d) list of impaired waters. Once listed, a total maximum daily load (TMDL) must be developed for the impaired water body. The TMDL address all sources of the impairing pollutants from point, nonpoint, and natural sources that a water body may receive without exceeding applicable water quality standards (with a factor of safety included). Once established, the TMDL is allocated among current and future pollutant sources to the water body.

Sections of the CWA pertaining to regulating impacts on waters of the United States are described below.

Section 402

The 1972 amendments to the CWA established the NPDES permit program to control discharges of pollutants from point sources. In California, the SWRCB is authorized by the EPA to oversee the NPDES program through the regional board (see the related discussion in the section titled Porter-Cologne Water Quality Control Act below). The NPDES program provides for both general permits (those that cover a number of similar or related activities) and individual permits.

Section 404

CWA Section 404 regulates the discharge of dredged and fill materials into waters of the United States. Project proponents must obtain a permit from USACE for all discharges of dredged or fill materials into waters of the United States. Section 404 permits may be issued only for the “least environmental damaging practicable alternative.” That is, the authorization of a proposed project discharge is prohibited if an existing practicable alternative would have less of an environmental impact and lacks other significant adverse consequences.

Before any actions that might affect surface waters are carried out, a delineation of jurisdictional waters of the United States must be completed following USACE protocols to determine if the project area encompasses wetlands or other waters of the United States that qualify for the CWA protection. These waters include any or all of the following:

- ▲ areas with ordinary high-water marks of a stream, including perennial streams with defined bed and bank and any stream channel that conveys runoff, even if it has been realigned; and/or
- ▲ seasonal and perennial wetlands, including coastal wetlands.

Wetlands are defined for regulatory purposes as areas “inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions” (33 CFR 328.3, 40 CFR 230.3).

Under CWA Section 401, applicants for a federal license or permit such as the Section 404 permit must obtain certification from the state that the activity will not adversely affect water quality. In California the authority to grant or waive the requirement is delegated by the SWRCB to the nine RWQCBs.

National Pollutant Discharge Elimination System

The 1972 amendment to the CWA (Section 402) established the NPDES permit program. The NPDES permit program outlined in the CWA contains effluent limitation guidelines, water quality requirements, and permit program requirements for discharges to waters of the U.S. The EPA has overall responsibility for the NPDES program, but administration of the program in California has been delegated to the SWRCB and the nine RWQCBs. The goal of the NPDES non-point source regulations is to improve the quality of stormwater discharged to receiving waters to the “maximum extent practicable” through the use of best management practices (BMPs). Phase 1 of the NPDES stormwater program addressed discharges from MS4s serving populations over 100,000 and industrial activities including discharges from construction activities disturbing five acres or more. Phase 2 (implemented in 1999) regulations address small urban MS4s serving a population of 100,000 or less to obtain a municipal stormwater permit.

National Flood Insurance Act of 1968

Congress passed the National Flood Insurance Act of 1968 and the Flood Disaster Protection Act of 1973 in response to increasing costs of disaster relief. These acts reduce the need for large publicly funded flood control structures and disaster relief by providing flood insurance and restricting development on

floodplains, respectively. FEMA administers the National Flood Insurance Program, which was created by the National Flood Insurance Act of 1968, to provide subsidized flood insurance for those communities that comply with FEMA regulations. FEMA issues flood insurance rate maps (FIRMs) that delineate flood hazard zones in the community and show which areas are prone to flooding.

FEMA established the design standard for flood protection, with the minimum level of flood protection for new development determined to be the 1-in-100 annual exceedances probability (AEP) event (i.e., the 100-year flood event). Specifically, where levees provide flood protection, FEMA requires the levee crown to have 3 feet of freeboard above the one-in-100 AEP water surface elevation, except in the vicinity of a structure, such as a bridge, where the level of the crown must have 4 feet of freeboard for a distance of 100 feet upstream and downstream of the structure.

STATE

Central Valley Flood Protection Board

Originally known at the Reclamation Board, the Central Valley Flood Protection Board (CVFPB) was created by the California legislature in 1911 to establish and enforce appropriate standards for flood control. California Code of Regulations (CCR) Title 23- Waters, Division 1 - Central Valley Flood Protection Board, defines the CVFPB's duties and scope. The Board has jurisdictional authority to review and approve all projects on or near the Sacramento and San Joaquin Rivers or their tributaries. Dry Creek, Cirby Creek, and Linda Creek are all regulated streams within the jurisdiction of the CVFPB. Projects that are located within the vicinity of regulated levees, floodways, or within 30 feet of CVFPB jurisdictional streams are required to meet the design standards of CCR Title 23, Division 1, Article 8 and to obtain an encroachment permit from the CVFPB. Section 128 of the design standards specifically addresses the construction of bridges. Among other requirements, the bottom member (soffit) of a proposed bridge must be at least three (3) feet above the level of the design flood. The required clearance may be reduced to two (2) feet on minor streams at sites where significant amounts of stream debris are unlikely. CVFPB classifies streams as "major" or "minor" on a project specific basis taking into consideration the volume of debris that could be carried by the stream in a flood event.

Central Valley Flood Protection Act of 2008

The Central Valley Flood Protection Act of 2008 (also known as SB5, 2007) requires cities and counties to amend their general plans to strengthen the linkage between local land use planning decisions and floodplain management practices and provide new requirements and standards for flood protection.

Since 2007, there have been legislative amendments to SB 5 that relate to land use planning requirements. SB 1278 (2012), AB 1965 (2012), and AB 1259 (2013) are the most recent amendments.

As currently amended, SB 5 requires regulation of specific locations within the 200-year floodplain (called the Urban Level of Flood Protection, or ULOP). There are five locational criteria which must all be met in order for the ULOP to apply. While all areas of the City of Roseville meet two of the criteria (the City is an urban area of more than 10,000 people and the City is within the Sacramento-San Joaquin Valley) only certain areas of the City meet the remaining three criteria. These are: 1) located within a flood hazard zone that is mapped as either a special hazard area or an area of moderate hazard on FEMA's official (i.e., effective) Flood Insurance Rate Map for the National Flood Insurance Program; 2) located within an area with a potential flood depth above 3 feet, from sources other than localized conditions; and, 3) located within a watershed with a contributing area of more than 10 square miles. In areas not subject to the ULOP standards, the 100-year floodplain standards continue to apply. The combination of ULOP and 100-year floodplains is referred to as the City's Regulatory Floodplain.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act of 1969 (Porter-Cologne Act) is California's statutory authority for the protection of water quality. The act sets forth the obligations of the SWRCB and RWQCBs under the CWA to adopt and periodically update water quality control plans, or basin plans. Basin plans are plans in which beneficial uses, water quality objectives, and implementation programs are established for each of the nine regions in California. The Porter-Cologne Act also requires waste dischargers to notify the RWQCBs of such activities by filing Reports of Waste Discharge and authorizes the SWRCB and RWQCBs to issue and enforce waste discharge requirements, NPDES permits, Section 401 water quality certifications, or other approvals.

State Water Resources Control Board

In California, SWRCB has broad authority over water quality control issues for the state. The 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 (for drinking water regulations), the California Department of Pesticide Regulation, the California Department of Fish and Wildlife (CDFW) (formerly Department of Fish and Game), and the Office of Environmental Health and Hazard Assessment. Regional authority for planning, permitting, and enforcement is delegated to the nine regional water boards. The regional boards are required to formulate and adopt water quality control plans for all areas in the region and establish water quality objectives in the plans. The Central Valley RWQCB is responsible for the water bodies in the project vicinity.

Water Quality Control Plan for the Sacramento River and San Joaquin River Basins

The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) (2011) presents water quality standards and control measures for surface and ground waters for a significant portion of the Central Valley Region, including the Dry Creek watershed. The Basin Plan designated beneficial uses for water bodies and established water quality objectives, waste discharge prohibitions, and other implementation measures to protect those beneficial uses. The Basin Plan contains both narrative and numeric water quality objectives for the region. Ambient water quality standards are set as objectives for a body of water and effluent limits (or discharge standards) are conditions in state or federal wastewater discharge permits, such as the NPDES permits. Land uses and activities that could degrade water quality and BMPs that could be used to address various nonpoint sources of pollution are identified in the Basin Plan.

Beneficial Uses

Every water body within the jurisdiction of the Central Valley RWQCB is designated a set of beneficial uses. Small tributary streams are designated with the same beneficial uses of the waterbody that they drain into. The project area is located within Hydrologic Unit 519.21, "Folsom Dam to Sacramento River," and the project area streams are assigned the following beneficial uses (Central Valley RWQCB 2011):

- ▲ **Municipal and Domestic Supply** – waters used for community, military, or individual water supply systems including, but not limited to, drinking water supply.
- ▲ **Agricultural Supply (Irrigation)** – waters used for farming, horticulture, or ranching, including, but not limited to, irrigation and support of vegetation for range grazing.
- ▲ **Industrial Service Supply** – waters used for industrial activities that do not depend primarily on water quality including, but not limited to, mining, cooling water supply, hydraulic conveyance, gravel washing, and fire protection.
- ▲ **Hydropower Generation** – water used for hydroelectric power generation.
- ▲ **Water Contact Recreation**- water used for recreational activities involving body contact with water where ingestion of water is reasonably possible. These include, but are not limited to swimming, water-skiing, fishing, and others.

- ▲ **Noncontact Water Recreation** – used of waters used for recreational activities involving proximity to water, but not normally involving body contact with water. These uses include, but are not limited to, picnicking, sunbathing, hiking, beachcombing, camping, boating, and others.
- ▲ **Warm Freshwater Habitat** – Uses of water that support warm water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including vertebrates.
- ▲ **Cold Freshwater Habitat** – uses of water that support cold water ecosystems including, but not limited to, preservation and enhancement of aquatic habitats, vegetation, fish, and wildlife, including invertebrates.
- ▲ **Migration of Aquatic Organisms** – uses of waters that support habitats necessary for migration, acclimatization between fresh and salt water, or temporary activities by aquatic organisms, such as anadromous fish. Warm water species include striped bass, sturgeon, and shad. Cold water species include salmon and steelhead.
- ▲ **Wildlife Habitat** – uses of waters that support wildlife habitats including, but not limited to, the preservation and enhancement of vegetation and prey species, such as waterfowl.

Water Quality Objectives

The Porter-Cologne Water Quality Control Act defines water quality objectives as “...the limits or levels of water quality constituents or characteristics which are established for reasonable protection of beneficial uses of water or the prevention of nuisance within a specific area.” There are two forms of water quality objectives:

- ▲ **Narrative** objectives present a general description of water quality that must be attained through pollutant control measures and watershed management. They also serve as the basis for the development of detailed numerical objectives.
- ▲ **Numerical** objectives typically describe pollutant concentrations, physical and chemical conditions of the water, and toxicity of the water to aquatic organisms. Places where numerical limits are specified represent the maximum levels that will allow the beneficial use to continue unimpaired. In other cases, an objective may prohibit the discharge of specific substances, tolerate natural or “background” levels of certain substances or characteristics (but not increases over those values), or may express a limit, in terms of not impacting other beneficial uses. An adverse effect or impact on a beneficial use occurs where there is an actual or threatened loss or impairment of that beneficial use.

The Basin Plan established the water quality objectives listed in Table 4.8-2 in support of the beneficial uses within Hydrologic Unit 519.21 (including Dry Creek, Linda Creek, and Cirby Creek).

Table 4.8-2 Water Quality Objectives for Hydrologic Unit 519.21 – Folsom Dam to Sacramento River

Constituent/Parameter	Water Quality Objective
Arsenic, Copper, Cyanide, or Silver	0.01 mg/L
Barium or Zinc	0.1 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Color	Water shall be free of discoloration that causes nuisance or adversely affects beneficial uses.
Dissolved Oxygen (DO)	The monthly median of the mean daily DO concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation. The DO concentrations shall not be reduced below the following minimum levels at any time: Waters designated WARM 5.0 mg/l

Table 4.8-2 Water Quality Objectives for Hydrologic Unit 519.21 – Folsom Dam to Sacramento River

Constituent/Parameter	Water Quality Objective
	Waters designated COLD 7.0 mg/l Waters designated SPWN 7.0 mg/l
Floating Material	Water shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses.
Oil & Grease	Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
pH	The pH shall not be depressed below 6.5 nor raised above 8.5.
Pesticides	No individual pesticide or combination of pesticides shall be present in concentrations that adversely affect beneficial uses.
Radioactivity	Radionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life.
Salinity (Total Dissolved solids)	Shall not exceed 125 mg/L (90 percentile)
Sediment	The suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses.
Settleable Material	Waters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.
Suspended Material	Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.
Tastes and Odors	Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.
Temperature	The natural receiving water temperature of intrastate waters shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses.
Toxicity	All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.
Turbidity	The turbidity shall be less than or equal 10 NTUs.

Source: Central Valley RWQCB 2011

National Pollutant Discharge Elimination System Permits

The SWRCB and Central Valley 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 the Central Valley RWQCB and design and operational BMPs must be implemented to reduce the level of contaminated runoff. BMPs can include the development and implementation of regulatory measures (local authority of drainage facility design) 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

The SWRCB adopted the statewide NPDES General Construction Permit in August 1999. The state requires that projects disturbing more than 1 acre of land during construction file a Notice of Intent with the RWQCB to be covered under this permit. Construction activities subject to the General Construction 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 storm water 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 off-site into receiving waters throughout the construction and life of the project; the BMPs must address source control and, if necessary, pollutant control.

Dewatering Activities

While small amounts of construction-related dewatering activities are covered under the NPDES General Construction Permit, Central Valley RWQCB has also adopted a General Order for Dewatering and Other Low Threat Discharges to Surface Waters (General Dewatering Permit). This permit applies to various categories of dewatering activities and would likely apply to the proposed multi-use trail project if construction required dewatering in greater quantities than that allowed by the General Construction Permit and discharged effluent to surface waters. Permit conditions for discharge of these types of wastewaters to surface water are specified in the General Order for Waste Discharge Requirements for Limited Threat Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Threat Discharges to Surface Waters (Central Valley RWQCB Order No. R5-2013-0073-01, NPDES No. CAG995002).

State Nondegradation Policy

In 1968, as required under the federal antidegradation policy described previously, the 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 provides as follows:

- 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.

LOCAL

Placer County Flood Control and Water Conservation District

The PCFCWCD was established by Senate Bill 1312, effective August 23, 1984. The PCFCWCD develops regional strategies for flood control management. In 1990, the PCFCWCD published the Stormwater Management Manual (SWMM) that contains specifications and policies for the design of storm drain facilities. The SWMM criteria are referenced in Section 10 of the City's Improvement Standards.

City of Roseville General Plan

The City of Roseville 2035 General Plan includes the following regulations and policies related to hydrology and water quality that are applicable to the proposed project:

Floodplain Development Regulations

Within the City of Roseville, no development is permitted within the regulatory floodway, but may be permitted within the floodway fringe in Infill areas. Exceptions may be provided for service facilities such as roads, infrastructure, and detention facilities provided that no feasible alternatives exist and the facility has been designed to minimize impacts and would not result in off-site increases in water surface elevation. Development within the City's Regulatory Floodplain shall be regulated as follows:

1. Infill Areas

No development is permitted within the regulatory floodway. Development may be permitted by the City within the regulatory floodway fringe. Such development shall be limited to that falling within the assumed cumulative one-foot rise in the water surface elevation.

2. Remainder of the City (Specific Plans, and the North Industrial Area).

No development is permitted within the City's Regulatory Floodplain (floodway and floodway fringe). Exceptions may be considered by the City for unusual conditions on a case-by-case basis if the encroachment is limited to only the floodway fringe and would not result in any off-site increase in the water surface elevation.

Essential Services Exceptions

On-site increases in the water surface elevation and/or fill within the regulatory floodplain, including the floodway, may be permitted by the City on an exception basis if associated with essential facilities and services such as roads, infrastructure, and detention facilities subject to the following criteria:

- ▲ No feasible¹ alternatives exist that would eliminate or reduce the need for fill and/or an increase in the water surface elevation and would result in a lesser impact to the environment.

The facility has been designed to result in the minimum amount of fill and impact necessary to achieve its intended purpose and results in no off-site increase in the water surface elevation.

Flood Protection Goals and Policies

GOAL 1: Minimize the potential for loss of life and property due to flooding.

GOAL 2: Pursue flood control solutions that are cost-effective and minimize environmental impacts.

- ▲ **Policy 1:** Continue to regulate, through land use, zoning, and other restrictions, all uses and development in areas subject to potential flooding and require new development to comply with the State Plan of Flood Control.
- ▲ **Policy 2:** Monitor and regularly update City flood studies, modeling, and associated land use, zoning, and other development regulations.
- ▲ **Policy 3:** Continue to pursue a regional approach to flood issues.
- ▲ **Policy 5:** Minimize the potential for flood damage to public and emergency facilities, utilities, roadways, and other infrastructure.
- ▲ **Policy 6:** Require new developments to provide mitigation to insure that the cumulative rate of peak runoff is maintained at pre-development levels.
- ▲ **Policy 7:** Continue to implement the Storm Maintenance Program to keep creeks and storm drain systems free of debris.
- ▲ **Policy 9:** Where feasible, maintain natural stream courses and adjacent habitat and combine flood-control, recreation, water quality, and open space functions.

¹ Feasible (in this context) is defined as capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social, and technological factors

Groundwater Recharge and Water Quality

GOAL 1: Continue to improve surface water quality and accommodate water flow increases.

GOAL 2: Enhance the quality and quantity of groundwater resources.

- ▲ **Policy 1:** Utilize cost-effective urban run-off controls, including Best Management Practices, to limit urban pollutants from entering watercourses.
- ▲ **Policy 2:** Implement erosion control and topsoil conservation measures to limit sediments within watercourses.
- ▲ **Policy 5:** Continue to monitor groundwater resources and investigate strategies for enhanced sustainable use. Areas where recharge potential is determined to be high shall be considered for designation as open space.
- ▲ **Policy 6:** Where feasible, locate stormwater retention ponds in areas where subsoil is suitable for groundwater recharge.

City of Roseville Stormwater Management Program

The City's Stormwater Management Program (SWMP) contains policies, activities, and strategies that comprise the City's minimum control measures and BMPs that address NPDES requirements for the Phase 2 Stormwater Permit. The six minimum control measures required under the NPDES permit are public outreach, public involvement, illicit discharge detection and elimination, construction site runoff, new development and redevelopment, and municipal operations (PCOR 2004). Some specific control measures described in the SWMP include storm drain labeling, development of a storm sewer system map, establishing a stormwater ordinance, site inspections to identify illicit connections and non-stormwater discharges to the storm sewer, and structural controls (such as detention ponds, vegetative areas, and runoff pretreatment) and non-structural controls (such as alternative construction methods, site design, and zoning) (City of Roseville 2004).

The City adopted the "Urban Stormwater Quality Management and Discharge Control Ordinance" in 2006 to establish a regulatory framework to implement construction and post-construction stormwater controls and regulate illicit discharges and connections to the City's stormwater conveyance system from both residential and business sources. The City has adopted the Stormwater BMP Guidance Manual for Construction and the West Placer Storm Water Quality Design Manual (Placer County 2016). The city has the authority during plan checks and site inspections to enforce SWMP. Additionally, prior to final approval, the owner of any stormwater control structure is required to submit an operations and maintenance manual and a proposed maintenance schedule.

Grading Ordinance

Section 16.20.040 of the Roseville Municipal Code regulates stockpiling and grading, and addressed conditions under which permits and grading plans are required. Section 16.20.070 identifies grading plan performance standards. Both Minor and Major grading plans are required by the City. A Major grading plan is required for any project that would result in the placement of fill in a channel or tributary that carries flow of 200 cubic feet/second or more during a 10-year storm event. Major grading plans must be reviewed and approved by the planning commission. All grading plans must comply with the following criteria:

- A. Fill or cut slopes with a height exceeding five feet shall not exceed a slope of 4:1.
- B. When grading around native oak trees:
 1. Cut or fill slopes exceeding two feet in height shall not be permitted within a distance of 1.5 times the radius of the tree's protected zone,

2. the grade shall not be raised or lowered around more than 50 percent of the protected zone, and
3. the grading shall not change the drainage pattern within a distance of 1.5 times the radius of the tree's protected zone.

If impacts to native oak trees cannot be avoided, the project must apply for a Tree Permit and comply with all protections included in the permit.

Section 16.20.020 requires that all grading be performed in accordance with either City of Roseville Improvement Standards or Chapter 16 of the Zoning Ordinance, whichever is more restrictive. A project applicant must have an Improvement and/or Grading Plan along with a site-specific SWPPP prior to the start of grading activities. Slopes or banks along creek channels must be designed with proper slope protection to prevent soil erosion and channel-bank undercutting.

Flood Damage Prevention Ordinance

Section 9.80 of the Roseville Municipal Code is the Flood Damage Prevention ordinance. As described in the applicable City of Roseville General Plan goals and policies listed above, land uses and development within the City's regulatory floodplain are restricted to protect residents and structures from risks associated with flooding. Railroads, streets, bridges, utility transmission lines, pipelines, and other similar uses of a primarily open space nature may be permitted in the floodplain with the approval of a flood encroachment permit. All uses permitted within the floodplain must comply with Section 19.80.040 of the municipal code which prohibits any development from increasing peak flows; adversely affecting the stream channel, increasing flood heights, or have an adverse effect on a proposed use. An adverse effect on base flood elevations is considered to be when the cumulative effect of the proposed development will increase the base flood elevations by one-tenth of one foot or more at any point outside of the property controlled by the developer (Section 9.80.040). Within the floodway (see Exhibit 4.8-1), all new development is prohibited unless a certified professional engineer certifies that the encroachment will not result in any increase in flood levels (Section 9.80.210). In addition, the following conditions apply:

- Any fill placed in the floodplain must be shown to serve some beneficial purpose, must be limited to the minimum amount necessary to meet its purpose, and any fill or excavation must be protected against erosion by rip-rap, vegetative cover, or bulkheading.
- Storage or processing of materials that are buoyant, flammable, toxic, explosive, or could be injurious to animal or plant life in time of flooding is prohibited. Storage of other materials may be allowed if it will not be damaged by floods and is readily removable from the area within the time available after flood warning. All materials stored in the floodplain must be anchored or be readily removable during flood season.

The City Council may grant a variance from these ordinances for a project, taking into consideration public safety, project engineering, and the public service provided by the project (Section 9.80.310). The City of Roseville regulatory floodplain is shown on Exhibit 4.8-3.

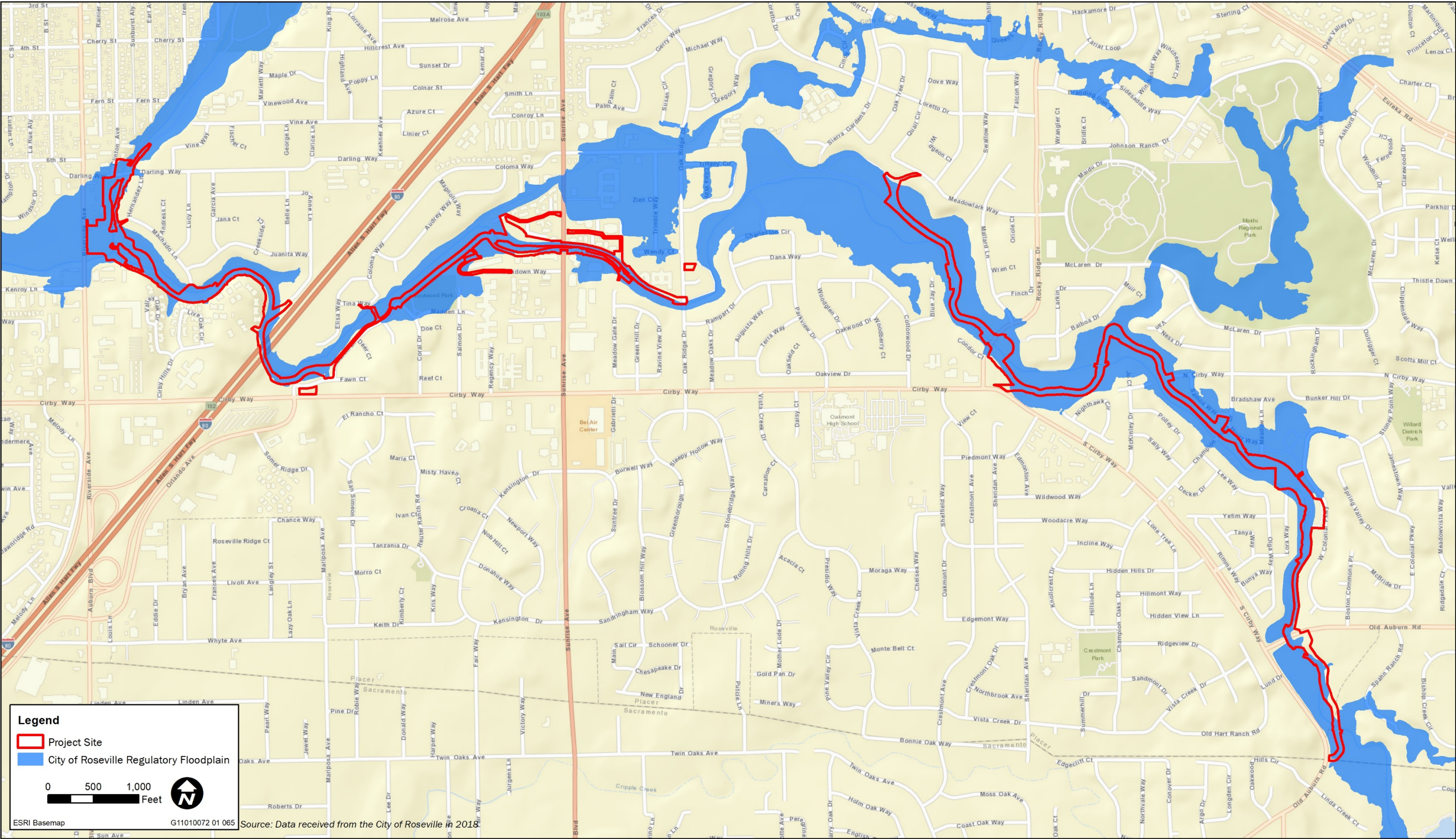


Exhibit 4.8-3



4.8.4 Impacts and Mitigation Measures

METHODS OF ANALYSIS

Evaluation of potential hydrologic and water quality impacts was based on a review of information from the hydrologic studies completed for this project and previously completed documents that address water resources in the project vicinity. The information obtained from these sources was reviewed and summarized to establish existing conditions and to identify potential environmental effects, based on the standards of significance presented in this section. This analysis incorporates the findings of the *Dry Creek Greenway Trail Fluvial Audit* (CBEC 2014) (see Appendix F) and the *Preliminary Geotechnical Evaluation, Dry Creek Greenway Multi-Use Trail Project, City of Roseville, CA* (Parikh 2015). These reports were prepared to inform project design. Many of the recommendations of these studies and those contained in the *Engineering Design Considerations and Evaluation based on Geomorphology Study* (PSOMAS 2014), such as bank stabilization elements, have been incorporated into the project, as described in Chapter 3, "Project Description," of this Draft EIR. In determining the level of significance, the analysis assumes that the proposed project would comply with relevant federal, State, and local ordinances and regulations.

THRESHOLDS OF SIGNIFICANCE

To determine whether environmental impacts to hydrology and water quality are significant environmental effects, Appendix G of the State CEQA Guidelines asks whether a project would do any of the following:

- ▲ violate any water quality standards or waste discharge requirements;
- ▲ substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (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);
- ▲ substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in substantial erosion, siltation or flooding on- or off-site;
- ▲ create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage, infiltration, and treatment systems or facilities resulting in increased sources of pollutants reaching surface waters or causing detrimental flooding to property or infrastructure;
- ▲ otherwise substantially degrade water quality;
- ▲ or Flood Insurance Rate Map or other flood hazard delineation map;
- ▲ place within a 100-year flood hazard area structures that would impede or redirect flood flows;
- ▲ expose people or structures to a significant risk of loss, injury, or death involving flooding; or
- ▲ result in substantial risk of inundation by seiche, tsunami, or mudflow.

ISSUES OR POTENTIAL IMPACTS NOT DISCUSSED FURTHER

The project is not located near large water bodies that could create the risk of inundation by seiche or tsunami. The project would not involve pumping of groundwater and the narrow linear nature of the path would allow surface runoff to infiltrate in the natural area adjacent to the path; therefore, the project would have no effect on groundwater recharge in the area. Additionally, the proposed project would not involve the development of housing within a 100-year flood hazard area. These issues are not discussed further in this document.

IMPACT ANALYSIS

Impact 4.8-1	Potential to violate any water quality standards or waste discharge requirements, or to otherwise degrade water quality.
Applicable Policies and Regulations	Clean Water Act Porter Cologne Water Quality Control Act State Non-degradation Policy City of Roseville Stormwater Management Plan City of Roseville Grading Ordinance City of Roseville Streambed Alteration Agreement for Routine Maintenance Activities
Significance with Policies and Regulations	Proposed Project: Less than significant Alignment Option 1A: Less than significant Alignment Option 1C: Less than significant Alignment Option 5A: Less than significant
Mitigation Measures	None required (Proposed Project, Option 1A, Option 1C, Option 5A)
Significance after Mitigation	Less than significant (Proposed Project, Option 1A, Option 1C, Option 5A)

Proposed Trail Alignment

Construction Impacts

Construction of the proposed multi-use trail would require removal of vegetation and existing features, grading, placement of aggregate base material, and construction of five roadway undercrossings, construction or modification of up to eight bridges (refer to Table 3-2 in Chapter 3, “Project Description”), and approximately 27,000 square feet of retaining walls (refer to Table 3-3 in Chapter 3, “Project Description”). These activities would create ground disturbance in the adjacent upland area, along the stream banks, and within the stream channel of Dry, Linda, and Cirby Creeks. This could accelerate erosion and introduce nutrients or suspend sediments which could degrade the water quality of the creeks. Additionally, the heavy equipment and tools required for construction of the project have the potential to introduce oil, grease, and chemical pollutants through leakage or an accidental spill.

Ground disturbance and vegetation removal in upland areas and areas outside of the stream channel would be required for construction access corridors and staging areas and for construction of the multi-use trail. Generally, the soils of the project area do not present a substantial risk of wind and water erosion (NRCS 2015) and the potential impacts to water quality related to ground disturbance in these areas would be minimal.

The project activities described above have the potential to negatively affect the water quality of the Dry, Linda, and Cirby Creeks; however, this potential would be minimized through compliance with protective city and state regulations. Both the City of Roseville Grading Permit and the SWRCB NPDES permit (which is required for all projects that disturb over one acre of soil), require the preparation of a SWPPP. A SWPPP has two major objectives: 1) to help identify the sources of sediment and other pollutants that affect the quality of storm water discharges; and 2) to describe and ensure the implementation of BMPs to reduce or eliminate sediment and other pollutants in stormwater and non-stormwater discharges. The SWPPP would be prepared by a qualified SWPPP practitioner and/or a qualified SWPPP developer that identifies water quality controls consistent with Central Valley RWQCB requirements and would ensure that runoff quality meets water quality objectives and maintains the beneficial uses of the project area streams. The SWPPP would describe the site controls, erosion and sediment controls, means of waste disposal, implementation of approved local plans, control of post-construction sediment and erosion control measures, and management controls unrelated to stormwater. The BMPs identified in the SWPPP would be implemented during all site development activities. The following would be required elements of the SWPPP:

- ▲ Temporary BMPs to prevent the transport of earthen materials and other construction waste materials from disturbed land areas, stockpiles, and staging areas during periods of precipitation or runoff, including: filter fence, fiber roll, erosion control blankets, mulch (such as wood chips); and temporary drainage swales and settling basins.
- ▲ Temporary BMPs to prevent the tracking of earthen materials and other waste materials from the project site to offsite locations, including stabilized points of entry/exit for construction vehicles/equipment and designated vehicle/equipment rinse stations, and sweeping.
- ▲ Temporary BMPs to prevent wind erosion of earthen materials and other waste materials from the project site, including routine application of water to disturbed land areas and covering of stockpiles with plastic or fabric sheeting.

A spill prevention and containment plan would be prepared and implemented. Project contractors would be responsible for storing on-site materials and temporary BMPs capable of capturing and containing pollutants from fueling operations, fuel storage areas, and other areas used for the storage of hydrocarbon-based materials. This would include maintaining materials on-site (such as oil absorbent booms and sheets) for the cleanup of accidental spills, drip pans beneath construction equipment, training of site workers in spill response measures, immediate cleanup of spilled materials in accordance with directives from the Central Valley RWQCB, and proper disposal of waste materials at an approved off-site location that is licensed to receive such wastes.

- ▲ Temporary BMPs to capture and contain pollutants generated by concrete construction including lined containment for rinsate (rinse water from truck washing) to collect runoff from washing of concrete delivery trucks and equipment.
- ▲ Protective fencing to prevent damage to trees and other vegetation to remain after construction, including tree protection fencing and individual tree protection such as wood slats strapped along the circumference of trees.
- ▲ Temporary BMPs for the containment of removal of drilling spoils generated from construction of bridge foundations and abutments.
- ▲ Daily inspection and maintenance of temporary BMPs. The prime contractor would be required to maintain a daily log of Temporary Construction BMP inspections and keep the log on site during project construction for review by Central Valley RWQCB.
- ▲ Tree removal activities, including the dropping of trees, would be confined to the construction limit boundaries.
- ▲ Construction boundary fencing to limit disturbance and prevent access to areas not under active construction.
- ▲ Post-construction BMPs and BMP maintenance schedule. Post construction BMPs must address water quality, channel protection, overbank flood protection and extreme flood protection.
- ▲ Revegetation of disturbed areas with approved native seed mixes as described in the City of Roseville Design Standards.

The SWPPP described above would be submitted to the City and the Central Valley RWQCB in conjunction with submission of the Improvement and Grading Plans and NPDES permit. City staff would review the SWPPP against the requirements of the City's municipal stormwater permit and the City's Urban Stormwater Quality Management and Discharge Control Ordinance. During construction, city staff would conduct regular inspections of the site to verify that effective stormwater BMPs are implemented and maintained.

Construction associated with the proposed project would require the use and handling of hazardous materials such as fuels, lubricants, coolants, hydraulic fluids, and cleaning solvents. The use and handling of these materials presents the potential to degrade water quality through accidental spills. Implementation of the Spill Response and Prevention Plan (a required component of the NPDES permit

SWPPP) would reduce the potential of directly and indirectly affecting water quality through construction-related hazardous material spills.

In-Stream Construction Activities

The proposed project would require temporary and permanent disturbance below the ordinary high-water mark of Dry, Cirby, and Linda Creeks for the installation of bridges, roadway undercrossings, and stabilization of stream banks. In-channel construction activities could result in a plume of sediments generated from the channel bottom and the channel side becoming suspended in the water.

Suspended sediments could potentially generate turbidity levels during construction that exceed the water quality objectives (Turbidity of ≤ 10 NTU) established by Central Valley RWQCB (PSOMAS 2015a). Table 4.8-3 provides the extent of in-stream disturbance associated with the proposed project. Each type of disturbance is further discussed below.

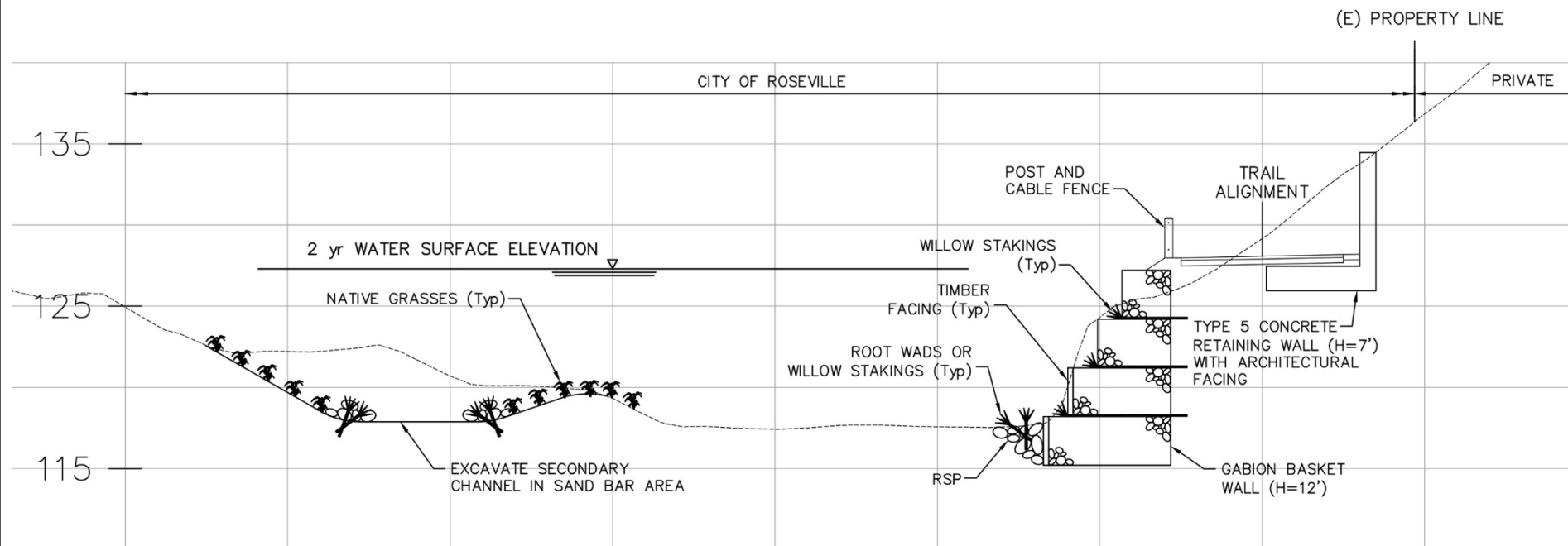
Table 4.8-3 Disturbance Resulting from In-Stream Project Components

Disturbance Type	Bridges	Bank Stabilization	Undercrossings	Total
Permanent Disturbance				
Loss of streambed (square feet)	9	1,236	0	1,245
Temporary Disturbance				
Disturbance below the Ordinary High-Water Mark (acres)	0.26	0.26	0.22	0.74
Disturbance within Low Flow Channel (acres)	0.06	0.12	0.05	0.23
Source: PSOMAS 2015b, Instream elements detail drawings.				

With one exception, all proposed bridges would fully span the low flow channel of the stream. Abutments would be supported by 24-inch diameter piles cast in holes drilled into the stream bank. The Darling Way bridge would require one pile to be installed within the low flow channel of the stream. The construction area for the in-stream pile would be isolated from the flow of the creek through the temporary use of a water tight coffer dam. The coffer dam would minimize the temporary increase in turbidity within the stream, prevent scour and maintain soil- and water-free footings to allow for pile construction. After construction of the footing, the coffer dam would be removed and the remaining portion of the bridge would be constructed. Additional BMPs such as barriers, silt fencing, and dust control would be implemented to avoid or minimize the movement of soils into the water; however, some temporary increase in turbidity would occur. This direct increase in turbidity levels would not be considered significant because turbidity would be monitored and construction work would be slowed or stopped if turbidity nears regulation thresholds. Turbidity levels would return to pre-project conditions after construction is completed.

The amount of in-stream disturbance resulting from construction of undercrossings would be minimized through the use of existing structures. Four of the undercrossings would be beneath existing bridges and would require excavation for the installation of retaining walls, excavation and removal of soil, and installation of concrete and rock slope protection. The fifth undercrossing (at Rocky Ridge Drive) would add a sixth box culvert to the series of culverts that comprise the stream crossing. This would require excavation for construction of retaining walls and wing walls, and installation of cutoff walls that isolate the work site from groundwater and minimize the need for dewatering.

Streambank stabilization using gabion baskets would be required in three locations and would result in the permanent loss of 1,236 square feet of stream bed. Installation of the gabions would involve excavation of areas within the stream bed and bank, stream diversions in two locations on Linda Creek and excavation of a sand bar in Cirby Creek to create a secondary low flow channel. Exhibit 4.8-4 provides an example of potential streambank stabilization work within Cirby Creek.



STA 34+00
SITE: CIRBY H-1

Source: Prepared by PSOMAS in 2018

X11010072 01 016

Dewatering

Construction or modification of bridges would require the installation of deep bridge piles that extend approximately 25 feet below the soil surface. These piles would be cast-in-drilled-hole piles, in which the hole is excavated using a specialized drilling auger, reinforced, and then filled with concrete to form the pile. The wet soil and water would be pumped out of the hole and into a collection system. Water pumped from excavation activities in the stream channel or in areas of high groundwater would contain suspended sediments and other solids and could negatively affect water quality if discharged directly to the adjacent stream, wetlands or municipal storm drains.

The potential effects of dewatering discharge would be minimized through compliance with existing Central Valley RWQCB regulation. In addition to the SWPPP described above, dewatering activities associated with the proposed project would be covered under the Central Valley RWQCB General Dewatering Permit (Order No. R5-2013-0073-01, NPDES No. CAG995002). The General Dewatering Permit encourages disposal of wastewater on land where possible and requires applicants to evaluate land disposal as a first alternative. The General Dewatering Permit contains a comprehensive set of effluent limitations that must be met by all discharges to surface water through the implementation of site specific BMPs. These include:

- ▲ limitations on the amount of heavy metals, fertilizers, pesticides, hydrocarbons, Volatile Organic Compounds, and industrial contaminants;
- ▲ protections against negative physiological responses in human, plant, animal, or aquatic life;
- ▲ limitations on temperature, salinity, and pH;
- ▲ protections for color, taste, and odor;
- ▲ restrictions on oil and grease;
- ▲ protection of dissolved oxygen levels,
- ▲ limitations on suspended sediments and other suspended and settleable materials; and
- ▲ restrictions on turbidity so that the discharge shall not exceed:
 - more than 1 NTU where natural turbidity is between 1 and 5 NTUs;
 - more than 20 percent where natural turbidity is between 50 and 100 NTUs; and
 - more than 10 percent where natural turbidity is greater than 100 NTUs.

If information becomes available that shows there is a reasonable potential for a project dewatering discharge to exceed these limits or any other water quality objectives, the discharge must be immediately stopped. All dewatering associated with the proposed project would be required to comply with these conditions and protect the beneficial uses of Dry, Linda, and Cirby Creeks.

Stream Diversions

Temporary stream diversions (clear water diversions) would be installed for the construction of new bridges, the Darling Way bridge widening, the Rocky Ridge and Old Auburn Road undercrossings, and for the three stream bank stabilization components. Clear water diversions are used in waterways to enclose a construction area and reduce sediment pollution from construction work taking place in or adjacent to water. The diversions would consist of a temporary dam constructed just upstream of the existing bridge and temporary pipes of sufficient number and size to carry stream flow from the temporary dam, through the construction site, to a point downstream. In addition to a piped diversion, the Cirby Creek bank stabilization area would also include the excavation of a secondary low flow channel in a sand bar on the opposite side of the stream bed. This secondary channel would be vegetated with native grasses and would remain after completion of the project. After the completion of in-channel construction, the diversion dams would be removed and the stream bed restored.

The NPDES California general construction permit allows temporary stream diversions provided that the discharge complies with the BMPs described in the SWPPP, is filtered or treated, does not exceed numeric action levels for pH and turbidity, and will not cause or contribute to a violation of water quality standards (SWRCB 2009). The proposed stream diversions would isolate areas of ground disturbance from the flowing water of the stream and would reduce the potential for water quality degradation resulting from in-stream construction activity.

Implementation of the proposed project would require construction activities within the stream channel that would require dewatering and stream diversions. The estimated volume of dewatering waste produced and the design of infiltration basins, filtration systems, and other BMPs would be developed prior to the final design phase of the project. As required by the NPDES California general construction and General Dewatering permits, filtration devices and systems would be provided to remove pollutants and suspended sediments generated during dewatering activities. A dewatering plan approved by the Central Valley RWQCB would be prepared as a component of the SWPPP, and all dewatering waste discharged to surface water would meet the applicable water quality objectives (refer to beneficial uses and water quality objectives described above).

Because SWRCB, Central Valley RWQCB, and City of Roseville regulations are in place to minimize erosion and transport of sediment and other pollutants during construction, and appropriate project-specific measures would be defined to secure necessary permits and approvals, construction-related impacts would be minimized and would not result in substantial adverse effect on water quality.

Use-related Impacts

The long-term maintenance and repair of the multi-use trail would require the use of various tools and equipment that have the potential to introduce oil, grease, litter, and chemical pollutants into Dry, Linda, and Cirby Creeks. Additionally, potential users of the trail may inadvertently or intentionally introduce contaminants, such as litter, sanitary wastes, and pet wastes. Over time, these contaminants could accumulate and adversely affect the water quality of Dry, Linda, and Cirby Creeks.

The potential for long-term use and maintenance of the trail to affect water quality would be minimized through compliance with the existing CDFW Streambed Alteration Agreement for the City of Roseville Routine Maintenance of Streams and Drainage Facilities project (Agreement). This Agreement covers routine activities, such as trail maintenance, channel alignment maintenance, debris removal, facilities repair or replacement, vegetation control in channels, minor erosion control work, and bridge washing and painting. The Agreement includes limits on the extent and intensity of each activity and measures to protect water quality such as sediment control, pollutant and litter management, and prohibitions on the use of heavy equipment in streams (CDFW 2017).

The use and maintenance of the proposed multi-use trail would involve activities that could negatively affect water quality. However, the City of Roseville conducts maintenance of its trail system under an existing agreement with CDFW which prescribes water quality protections for operation and maintenance activities.

Conclusion

Because SWRCB, Central Valley RWQCB, CDFW, and City of Roseville existing protections are in place, construction and the long-term use and maintenance of the proposed multi-use trail would have a **less-than-significant** impact on water quality.

Alignment Option 1A

Option 1A is the same as the Proposed Trail Alignment until the approach to the Dry Creek/Cirby Creek confluence and the first bridge. Where the Proposed Trail Alignment would cross Dry Creek via Bridge #2 and continue on the northern bank of Cirby Creek, Option 1A would cross Dry Creek via Bridge #3. By remaining on the south bank of Cirby Creek, Option 1A would not require the construction of Bridge #2 or Bridge #4. The streambank of Cirby Creek is moderately erosive in the Option 1A area,

and the proximity of private property would require the path to be located near the top of the bank. For this reason, Option 1A would require an additional 765 linear feet of retaining walls or streambank stabilization when compared to the Proposed Trail Alignment. As discussed in regards to the Proposed Trail Alignment above, construction of Option 1A would require compliance with SWRCB, Central Valley RWQCB, and City of Roseville regulations that would minimize the potential for construction-related water quality impacts. Additionally, the use and maintenance of the Option 1A alignment would comply with the protective conditions of the existing CDFW Routine Maintenance Agreement and would have a **less-than-significant** impact on water quality.

Alignment Option 1C

Option 1C is the same as the Proposed Trail Alignment with the exception that in the Sheet 1 Segment, the multi-use trail would be located on the northeastern side of Dry Creek. In the Sheet 1 Segment, the northeastern bank of Dry Creek is steep and erosive with little distance between the top of the bank and the adjacent private property (CBEC 2014 (see Appendix F)). Because of this, implementation of Option 1C would require an additional 1,080 linear feet of streambank stabilization. Option 1C would have the same bridges and undercrossings described above under the Proposed Trail Alignment, with the exception of the widening of the Darling Way Bridge (Bridge #1), and Option 1C would have the same construction and use-related impacts. As discussed under the Proposed Trail Alignment above, construction of Option 1C would require compliance with SWRCB, Central Valley RWQCB, and City of Roseville regulations which would minimize the potential for construction related water quality impacts. Additionally, the use and maintenance of the Option 1C alignment would comply with the protective conditions of the existing CDFW Routine Maintenance Agreement and would have a **less-than-significant** impact on water quality.

Alignment Option 5A

Option 5A deviates from the Proposed Trail Alignment just west of Bridge #13. Bridge #13 would not be constructed, and Option 5A would remain on the south bank of Cirby Creek until crossing to the north bank via Bridge #14. Option 5A would include both an undercrossing of Sunrise Avenue and connecting paths to both sides of Sunrise Avenue. Both the Proposed Trail Alignment and Option 5A would make extensive use of retaining walls through this section of the path; however, Option 5A would require an additional 635 linear feet when compared to the Proposed Trail Alignment. As discussed in regards to the Proposed Trail Alignment above, construction of Option 5A would require compliance with SWRCB, Central Valley RWQCB, and City of Roseville regulations which would minimize the potential for construction related water quality impacts. Additionally, the use and maintenance of the Option 5A alignment would comply with the protective conditions of the existing CDFW Routine Maintenance Agreement and would have a **less-than-significant** impact on water quality.

Mitigation Measures

None required.

Impact 4.8-2	Potential to substantially alter existing drainage patterns or to create runoff volume that would exceed the capacity of drainage systems or result in erosion, siltation, or flooding.
Applicable Policies and Regulations	Federal Clean Water Act – NPDES Permits City of Roseville Urban Stormwater Quality Management and Discharge Control Ordinance
Significance with Policies and Regulations	Proposed Project: Less than significant Alignment Option 1A: Less than significant Alignment Option 1C: Less than significant Alignment Option 5A: Less than significant
Mitigation Measures	None required (Proposed Project, Option 1A, Option 1C, Option 5A)
Significance after Mitigation	Less than significant (Proposed Project, Option 1A, Option 1C, Option 5A)

Proposed Trail Alignment

The amount of stormwater runoff generated from an area is affected by development through conversion of vegetated or pervious surfaces to impervious surfaces 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 of runoff and eliminate storage and infiltration that would naturally occur along drainage paths. As water runs off the land surface, it collects and carries materials and sediment, which can be potentially harmful to downstream receiving waters. Additionally, runoff from impervious surfaces can become concentrated, causing erosion and increased sediment transport.

The proposed project would result in the construction and use of a paved multi-use trail and would increase the amount of impervious surface; reducing the amount of infiltration and increasing runoff volume. The impervious surface of the proposed trail would be a narrow linear feature surrounded by a natural area having soils with high to moderate infiltration rates (NRCS 2015). Stormwater from the proposed trail would run off as sheet flow into the adjacent natural areas and infiltrate into the soil. The trail could incorporate drainage swales on one or both shoulders when the project engineer determines that they are necessary to protect the structural integrity of the trail. Additionally, the project would be required to install and maintain permanent post construction water quality BMPs such as revegetation and stabilization of disturbed areas and contouring to mimic natural drainage patterns (as required by the SWPPP described above).

The proposed project would not alter existing drainage patterns except for the installation of drainage swales where needed to ensure slope stability as required by City of Roseville Design Standards. This would be a minor alteration of existing drainage patterns and would not create an adverse hydrologic effect.

The proposed project would not significantly alter drainage patterns on the site. Additionally, runoff from the proposed project would be readily infiltrated into the adjacent natural areas, and BMPs to control stormwater runoff and prevent erosion would be required by the Central Valley RWQCB SWPPP.

Conclusion

The potential for the proposed project to create an adverse effect resulting from alteration of drainage patterns or an increase in surface runoff would be **less than significant**.

Alignment Option 1A

The potential impacts related to drainage patterns and runoff volume are the same for Option 1A as those discussed under the Proposed Trail Alignment above. For the same reasons, Option 1A would not result in a significant alteration of drainage patterns or an increase in surface runoff. Therefore, the implementation of Option 1A would have a **less-than-significant** impact relative to these resources.

Alignment Option 1C

The potential impacts related to drainage patterns and runoff volume are the same for Option 1C as those discussed under the Proposed Trail Alignment above. For the same reasons, Option 1C would not result in a significant alteration of drainage patterns or an increase in surface runoff. Therefore, the implementation of Option 1C would have a **less-than-significant** impact relative to these resources.

Alignment Option 5A

The potential impacts related to drainage patterns and runoff volume are the same for Option 5A as those discussed under the Proposed Trail Alignment above. For the same reasons, Option 5A would not result in a significant alteration of drainage patterns or an increase in surface runoff. Therefore, the implementation of Option 5A would have a **less-than-significant** impact relative to these resources.

Mitigation Measures

None required.

Impact 4.8-3	Alter or redirect 100-year flood flows, or expose people or structures to risk of injury or damage by flood waters.
Applicable Policies and Regulations	National Flood Insurance Act of 1968 and all subsequent related legislation CVFPB 200-year Flood Protection Standards City of Roseville General Plan Safety Element City of Roseville Municipal Code, Section 19.80.040 City of Roseville Design and Construction Standards City of Roseville General Plan – Floodplain development
Significance with Policies and Regulations	Proposed Project: Less than significant Alignment Option 1A: Less than significant Alignment Option 1C: Less than significant Alignment Option 5A: Less than significant
Mitigation Measures	None required (Proposed Project, Option 1A, Option 1C, Option 5A)
Significance after Mitigation	Less than significant (Proposed Project, Option 1A, Option 1C, Option 5A)

Proposed Trail Alignment

The proposed Dry Creek Greenway East Trail would be located within the City of Roseville Floodway and the 100-year Floodplain as defined by FEMA (see Exhibit 4.8-1). In areas where the trail would be located below the 10-year flood event water surface elevation (WSE), the trail would conform to Section 13 Bikeways, of the City's Design/Construction Standards. All segments of the trail located below the 10-year flood WSE or positioned more than 45 degrees to the directional flow of water would be made of Portland cement concrete or another approved material and would have toe protection to prevent the trail from being undermined during flood events. The decks of the eight bridge structures included in the proposed project would be above the 10-year WSE. With the exception of bridges 13 and 21, all bridges would be designed to allow 3 feet of clearance between the soffit and the 200-year WSE in compliance with CVFPB bridge design standards for major streams (CCR Title 23, Division 1, Article 8, Section 128). Bridges 13 and 21 would require a variance from CVFPB standards which would be considered by CVFPB during a public hearing. For the two bridges that have soffits above the 10-year WSE but below the 200-year WSE, bridge railings would be designed to sustain the 100-year flood event without damage and without human intervention. Finally, where feasible, the approach ramps to bridges would be armored and would facilitate water movement around the bridge rather than directly over it.

The Location Hydraulic Report (PSOMAS 2016) and the Supplemental Hydraulic Analysis (PSOMAS 2017) prepared for the project evaluated the potential for the proposed project to affect 100-year flood levels. The Supplemental Hydraulic Analysis confirmed the findings of the Location Hydraulic Report using more recent data. The majority of the Proposed Trail Alignment would be located at-grade and would have a negligible effect on the floodplain. Creek and roadway crossings would be located perpendicular to flood flows and have the potential to increase flood water elevations or re-direct flood waters. As required by City of Roseville design standards, hydraulic and structural calculations were prepared for all project bridges based on the assumption that the bridge trusses would completely block the flow of water (PSOMAS 2016). With the exception of Bridge #13, all stream crossings and roadway undercrossings are located in the floodway fringe (refer to Exhibit 4.8-2). Bridge #13 would be constructed with a new reinforced concrete flat slab bike/pedestrian bridge over Linda Creek. The 100-year floodway extends beyond the main Linda Creek channel at this location because of the confluence with Cirby Creek. Although the bridge approaches and abutments would be located outside of the Linda Creek main channel, they would encroach within the floodway. All bridges, including Bridge # 13, would have a negligible effect (<0.1 feet) on WSE for the 100-year storm event.

The trail itself would be designed to minimize impacts to the floodplain and to withstand flood events; however, during high water flows, portions of the trail and components such as bridge structures and trailheads may be unsafe for use by pedestrians and bicyclists. The City operates a flood warning system that uses television, internet, telephone, and radio to provide residents with information related to water levels. This system is intended to provide up to three hours of advance warning (City of Roseville 2012) to warn against trail use. In addition, the City of Roseville uses portable signs to prohibit trail access during high water events.

Although the proposed project would be located within the 100-year floodplain and would be located below the 10-year water surface elevation in some areas, the trail would conform to all City standards for construction of bikeways in floodplains. The trail and its structures would be armored and secured to withstand flooding events without damage, and signage and flood warning systems would prevent use of the trail during high water events. All bridges and encroachments within the regulated floodway have been designed so that they would not create an adverse increase in the 100-year water surface elevation.

Conclusion

The implementation of the Proposed Trail Alignment would have a **less-than-significant** impact on flood flows.

Alignment Option 1A

Option 1A would require the construction of Bridge #3 instead of Bridge #2 and Bridge #4 and would, therefore, have a smaller encroachment footprint within the 100-year floodplain when compared to the Proposed Trail Alignment. As described under the Proposed Trail Alignment, all portions of the trail located below the 10-year water surface elevation would conform to Section 13, "Bikeways" of the City's Design/Construction Standards. The trail and its structures would be armored and secured to withstand flooding events without damage, and signage and flood warning systems would prevent use of the trail during high water events. No encroachments within the regulated floodway would result in an adverse increase in the 100-year WSE. Therefore, the implementation of Alignment Option 1A would have a **less-than-significant** impact on flood flows.

Alignment Option 1C

Option 1C would not require the widening of Darling Way Bridge (Bridge #1) and would therefore have a smaller encroachment footprint within the 100-year floodplain when compared to the Proposed Trail Alignment. As described under the Proposed Trail Alignment, all portions of the trail located below the 10-year water surface elevation would conform to Section 13, "Bikeways" of the City's Design/Construction Standards. The trail and its structures would be armored and secured to withstand flooding events without damage, and signage and flood warning systems would prevent use of the trail during high water events. No encroachments within the regulated floodway would result in an adverse increase in the 100-year WSE. Therefore, the implementation of Alignment Option 1C would have a **less-than-significant** impact on flood flows.

Alignment Option 5A

Option 5A would deviate from the Proposed Trail Alignment just west of Bridge #13 and would therefore not create the 100-year floodway impacts described under the Proposed Trail Alignment because Bridge #13 would not be constructed. Option 5A would cross Linda Creek via Bridge #14 and would result in no encroachments within the regulated floodway and therefore would not result in an increase in the 100-year WSE. In addition, Bridge #14 would meet CVFPB bridge design standards and would not require a CFVPB variance. This would be considered a **less-than-significant** impact.

Mitigation Measures

None required.

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