4.4 CULTURAL RESOURCES

4.4.1 Introduction

This section analyzes and evaluates the impacts of the proposed project on currently known and potential but unknown cultural resources. Cultural resources include districts, sites, buildings, structures, or objects generally older than 50 years and considered to be important to a culture, subculture, or community for scientific, traditional, religious, or other reasons.

Archaeological resources are locations where human activity has measurably altered the earth or left deposits of prehistoric or historic-era physical remains (e.g., stone tools, bottles, former roads, house foundations). Historical (or architectural) resources include standing buildings (e.g., houses, barns, outbuildings, cabins) and intact structures (e.g., dams, bridges).

The primary source of information for this section is the *Archeological Survey Report for the Dry Creek Greenway Multi-Use Trail Project*, prepared by ECORP Consulting, Inc. (2014).

One comment letter pertaining to cultural resources was received in response the Notice of Preparation (NOP). Gene Whitehouse, the Tribal Chairman of the United Auburn Indian Community (UAIC) of the Auburn Rancheria, expressed concern about development within ancestral territory and requested the opportunity to provide Tribal representatives to monitor projects if excavation and data recovery are required for prehistoric cultural sites or in cases where ground disturbance is proposed at or near sensitive cultural resources. This issue is discussed under “Native American Consultation and Other Interested Parties” and evaluated as part of Impact 4.4-1, below. As discussed below, technical reports prepared for the project related to cultural resources have been forwarded to the UAIC.

Recognizing the NOP release precedes the effective date of Assembly Bill (AB) 52, statutes of 2014, the procedural elements of AB 52 do not apply to the project (see Regulatory Setting, below). Nonetheless, this section includes consideration of the potential for the presence of tribal cultural resources as part of the environmental analysis.

4.4.2 Environmental Setting

REGIONAL PREHISTORY

Although the Sacramento Valley may have been inhabited by humans as early as 10,000 years ago, the evidence for early human use likely is buried by deep alluvial sediments that accumulated rapidly during the late Holocene epoch (less than 10,000 years ago). Although rare, archaeological remains of this early period have been identified in and around the Central Valley. Archaeologists working at Camanche Reservoir (east of Galt and Lodi) found a number of lithic cores and a flake that are associated with Pleistocene gravels. These archaeological remains have been grouped into what is called the Farmington Complex, which is characterized by core tools and large, reworked percussion flakes. The economy of this early period generally is thought to be based on exploitation of large game. Later periods are better understood because of more abundant representation in the archaeological record.

The taxonomic framework of the Sacramento Valley has been described in terms of archaeological patterns. A pattern is a general mode of life characterized archaeologically by technology, particular artifacts, economic systems, trade, burial practices, and other aspects of culture. Three general patterns of resource use for the period between 4500 before present (B.P.) and 200 B.P. have been identified: the Windmiller, Berkeley, and Augustine Patterns.

Windmiller Pattern (4500 B.P.–3000 B.P.)

The Windmiller Pattern shows evidence of a mixed economy of game procurement and use of wild plant foods. The archaeological record contains numerous projectile points with a wide range of faunal remains. Hunting was not limited to terrestrial animals, as is evidenced by fishing hooks and spears that have been found in association with the remains of sturgeon, salmon, and other fish. Plants also were used, as indicated by ground stone artifacts and clay balls that were used for boiling acorn mush. Settlement strategies during the Windmiller period reflect seasonal adaptations: habitation sites in the valley were occupied during the winter months, but populations moved into the foothills during the summer.

Berkeley Pattern (3500 B.P.–2500 B.P.)

The Windmiller Pattern ultimately changed to a more specialized adaptation labeled the Berkeley Pattern. A reduction in the number of manos and metates (grinding and mealing stones) and an increase in mortars and pestles indicate a greater dependence on acorns. Although gathered resources gained importance during this period, the continued presence of projectile points and atlatls (spear-throwers) in the archaeological record indicates that hunting was still an important activity.

Augustine Pattern (1500 B.P.–200 B.P.)

The Berkeley Pattern was superseded by the Augustine Pattern. The Augustine Pattern reflects a change in subsistence and land use patterns to those of the ethnographically known people (Nisenan) of the historic era. This pattern exhibits a great elaboration of ceremonial and social organization, including the development of social stratification. Exchange became well developed, and an even more intensive emphasis was placed on the use of the acorn, as evidenced by the presence in the archaeological record of shaped mortars and pestles and numerous hopper mortars. Other notable elements of the artifact assemblage associated with the Augustine Pattern are flanged tubular smoking pipes, harpoons, clam shell disc beads, and an especially elaborate baked clay industry, which included figurines and pottery vessels (Cosumnes Brownware). The presence of small projectile point types, referred to as the Gunther Barbed series, suggests the use of the bow and arrow. Other traits associated with the Augustine Pattern include the introduction of preinterment burning of offerings in a grave pit during mortuary ritual, increased village sedentism, population growth, and an incipient monetary economy in which beads were used as a standard of exchange.

ETHNOGRAPHY

Ethnographically, the proposed project site is in the southwestern portion of the territory occupied by the Penutian-speaking Nisenan. The territory extended from the area surrounding the current City of Oroville on the north to a few miles south of the American River in the south. The Sacramento River bounded the territory on the west, and in the east, it extended to a general area located within a few miles of Lake Tahoe. As a language, Nisenan (meaning “from among us” or “of our side”) has three main dialects – Northern Hill, Southern Hill, and Valley Nisenan, with three or four subdialects. The Valley Nisenan lived along the Sacramento River, primarily in large villages with populations of several hundred each. Between there and the foothills, the grassy plains were largely unsettled, used mainly as a foraging ground by both valley and hill groups. Individual and extended families “owned” hunting and gathering grounds, and trespassing was discouraged. Residence was generally patrilocal, but couples actually had a choice in the matter.

Politically, the Nisenan were divided into “tribelets,” made up of a primary village and a series of outlying hamlets, presided over by a more-or-less hereditary chief. Villages typically included family dwellings, acorn granaries, a sweathouse, and a dance house, owned by the chief. The chief had little authority to act on his or her own, but with the support of the shaman and the elders, the word of the chief became virtually the law.

Subsistence activities centered around the gathering of acorns (acorns from tan bark oak and black oak were preferred), seeds, and other plant resources. The hunting of animals such as deer and rabbits and fishing were also important parts of normal subsistence activities. Large predators, such as mountain lions, were hunted for their meat and skins, and bears were hunted ceremonially. Although acorns were the staple of the Nisenan diet, they also harvested roots like wild onion and "Indian potato," which were eaten raw, steamed, baked, or dried and processed into flour cakes to be stored for winter use. Wild garlic was used as soap/shampoo, and wild carrots were used medicinally. Seeds from grasses were parched, steam dried, or ground and made into a mush. Berries were collected, as were other native fruits and nuts. Game was prepared by roasting, baking, or drying. In addition, salt was obtained from a spring near modern-day Rocklin.

Hunting of deer often took the form of communal drives, involving several villages, with killing done by the best marksmen from each village. Snares, deadfalls, and decoys were used as well. Fish were caught by a variety of methods including use of hooks, harpoons, nets, weirs, traps, poisoning, and by hand. Trade was important with goods traveling from the coast and valleys up into the Sierra Nevada mountains and beyond to the east, and vice versa. Coastal items like shell beads, salmon, salt, and Foothill pine nuts were traded for resources from the mountains and farther inland, such as bows and arrows, deer skins, and sugar pine nuts. In addition, obsidian was imported from the north.

The Spanish arrived on the central California coast in 1769 and by 1776, the Miwok territory bordering the Nisenan on the south had been explored by José Canizares. In 1808, Gabriel Moraga crossed Nisenan territory, and in 1813, a major battle was fought between the Miwok and the Spaniards near the mouth of the Cosumnes River. Though the Nisenan appear to have escaped being removed to missions by the Spanish, they were not spared the ravages of European diseases. In 1833, an epidemic—probably malaria—raged through the Sacramento Valley, killing an estimated 75 percent of the native population. When John Sutter erected his fort at the future site of Sacramento in 1839, the few Nisenan survivors settled nearby. The discovery of gold in 1848 at Sutter's Mill, near the Nisenan village of Colluma (now Coloma) on the South Fork of the American River, drew thousands of miners into the area, and led to widespread killing and the virtual destruction of traditional Nisenan culture. By the Great Depression, no Nisenan remained who could remember the days before the arrival of the Euro-Americans.

REGIONAL HISTORY

Colonization of California began with the Spanish Portolá land expedition. The expedition, led by Captain Gaspar de Portolá of the Spanish army and Father Junipero Serra, a Franciscan missionary, explored the California coast from San Diego to the Monterey Bay Area in 1769. As a result of this expedition, Spanish missions to convert the native population, presidios (forts), and pueblos (towns) were established. The Franciscan missionary friars established 21 missions in Alta California (the area north of Baja California) beginning with Mission San Diego in 1769 and ending with the mission in Sonoma established in 1823. The purpose of the missions and presidios was to establish Spanish economic, military, political, and religious control over the Alta California territory. No missions were established in the Central Valley; the nearest missions were in the vicinity of San Francisco Bay. Presidios were established at San Francisco and Monterey.

After Mexico became independent from Spain in 1821, what is now California became the Mexican province of Alta California with its capital at Monterey. In 1827, American trapper Jedediah Smith traveled along the Sacramento River and into the San Joaquin Valley to meet other trappers of his company who were camped there, but no permanent settlements were established by the fur trappers.

The Mexican government closed the missions in the 1830s and former mission lands, as well as previously unoccupied areas, were granted to retired soldiers and other Mexican citizens for use as cattle ranches. Much of the land along the coast and in the interior valleys became part of Mexican land grants or "ranchos." During the Mexican period there were small towns at San Francisco (then known

as Yerba Buena) and Monterey. The rancho owners lived in one of the towns or in an adobe house on the rancho. The Mexican Period includes the years 1821 to 1848.

John Sutter, a European immigrant, built a fort at the confluence of the Sacramento and American Rivers in 1839 and petitioned the Mexican governor of Alta California for a land grant, which he received in 1841. Sutter built a flour mill and grew wheat near the fort. Gold was discovered in the flume of Sutter's lumber mill at Coloma on the South Fork of the American River in January 1848. The discovery of gold initiated the 1849 California Gold Rush, which brought thousands of miners and settlers to the Sierra foothills east and southeast of Sacramento.

The American period began when the Treaty of Guadalupe Hidalgo was signed between Mexico and the United States in 1848. As a result of the treaty, Alta California became part of the United States as the territory of California. Rapid population increase occasioned by the Gold Rush of 1849 allowed California to become a state in 1850. Most Mexican land grants were confirmed to the grantees by U.S. courts, but usually with more restricted boundaries, which were surveyed by the U.S. Surveyor General's office.

The proposed project site is located approximately two miles northeast of Samuel Norris' Rancho Del Paso and approximately 0.5-mile northwest of Joel P. Dedmond's Rancho San Juan. Land outside the land grants became federal public land, which was surveyed into sections, quarter-sections, and quarter-quarter sections. The federal public land could be purchased at a low fixed price per acre or could be obtained through homesteading (after 1862).

City of Roseville

Roseville had its beginnings in the aftermath of the California Gold Rush when discouraged gold seekers left the mineral regions to take up farming along rich creek bottom lands. These pioneers formed the nucleus of what was to become the "first families" of Roseville. One of the first sections of southwestern Placer County to be settled was the rich lands of the Dry Creek District.

Among the pioneer settlers of the Dry Creek District was Martin A. Schellhous who came to California with his wife and acquired a 240-acre ranch. Having brought a number of cattle with him from Michigan, Schellhous turned his attention to stock raising. Later diversifying and expanding his agricultural pursuits, he planted vineyards, orchards and fields of grain on his property.

Between 1870 and 1879, Roseville experienced slow but steady development. New construction already underway and reported in the Placer Herald of January 1, 1870 included a new hotel being erected by Daniel S. Neff, who had formerly operated the 17 Mile House. By 1890, though growth had not spiked, a movement toward a more industrial base had begun and business activity increased.

Fruit shipping became an important factor in the economy of Roseville at the beginning of the twentieth century. Figures compiled by the Roseville Board of Trade for 1901 revealed that during the year alone, more than 781,000 pounds of fresh deciduous fruits had been shipped from Roseville, along with 3,000 boxes of oranges, 22,380 pounds of pickled olives, and 8,000 pounds of olive oil. Hand in hand with the increased activity of shipping fruit was an upsurge in viticulture. Historic records indicate that a total of 1,195,436 boxes of grapes were shipped from the Roseville depot in 1901.

The new State Highway was routed through Roseville in 1912. Roads were paved commencing at the lower end of Riverside Avenue and connecting to the State Highway on the Lincoln Road. While Roseville was launching its new government and contributing its share to the war effort during World War I, the city continued to grow. In a two-and-a-half-year period (September 1911 – January 1914), more than 110 new buildings were erected. Population increased from 2,608 in 1910 to 4,477 in 1920. By 1924, Southern Pacific Railroad purchased 200 acres of land between Roseville and Antelope for relocation of Pacific Fruit Express shops and construction of 77 miles of new tracks to be used by both Southern Pacific and Pacific Fruit Express. By June 1927, the new facilities were in operation.

The considerable building and commercial development, which characterized Roseville throughout the 1920s, was curbed drastically by the Great Depression. However, municipal improvements continued to progress in spite of the Depression. Though Roseville had become a "city" in 1909, it was not until 1935 that voters, by a 443 to 194 count, permitted the community to become a "charter city" which gave residents the ability to change how their city is governed. Between 1941 and 1942, no major building activity was reported in the columns of The Press Tribune. By the latter date, however, approximately 1,000 new residents had moved into Roseville, most of whom worked in nearby defense installations or for the railroad.

The population boom, which hit southern California with sudden swiftness in the late 1940s and spread quickly to northern California in the following decades, focused on southwestern Placer County after 1960. George Buljan served as mayor during this period of rapid growth and great change. Buljan served on the City Council for 24 years. The city, among other things, named a middle school after him, which is located off Washington Boulevard, just east of the project site. The population boom of the 1960s continued throughout the 1970s.

RECORDS SEARCH

NCIC Records Search

A confidential records search for the project site and a surrounding half-mile radius (project area) was conducted by employees at the North Central Information Center (NCIC) on March 20, 2014 (NCIC Records Search Number PLA-14-32). The search included a review of the NRHP, the California Register of Historical Resources (CRHR), *California Inventory of Historic Resources* (1976), *California Points of Historical Interest* (May 1992 and updates), Directory of Properties in the Historic Property Data File, Archaeological Determinations of Eligibility (State Office of Historic Preservation computer lists dated 2012), records of previously recorded cultural resources, records of previous field studies, and other historic maps and documents.

Approximately 80 percent of the project site has been included in previous investigations. The previous studies were conducted between 1963 and 2007 and vary in size from less than one acre to 18 linear miles. The records search identified 12 previously recorded cultural resources located within 0.5 miles of the project site. Of 12 previously recorded cultural resources, six are prehistoric archaeological sites, five are historic-period buildings, structures, and refuse deposits, and one is a mixed deposit of prehistoric and historic material. Only one of the previously recorded resources, a historic-period concrete building foundation with associated refuse deposits (P-31-788), is located within the project site. No historic landmarks, historic markers, or properties listed in the California Register of Historical Resources were identified within the project area.

Native American Consultation and Other Interested Parties

The California Native American Heritage Commission (NAHC) was contacted on July 25, 2014, to request a search of their Sacred Lands database and a list of contact information for local Native American representatives in the project area. A response was received from the NAHC on July 31, 2014 stating that there are no known Sacred Lands within the project area and providing a list of eight Native American groups and individuals who may have additional information about the proposed project. On August 6, 2014, letters were sent letters to all persons or organizations on the NAHC list. Follow-up phone calls were conducted for every individual or group on the NAHC list on August 18 and 19, 2014, except for Grayson Coney, Cultural Director of the T'si-Akim Maidu. No phone number was available for Mr. Coney, so a follow-up email was sent on August 18, 2014.

On October 10, 2014, a response from the UAIC was received in which UAIC requested an opportunity to be present during field survey and a copy of all technical reports when completed. Because the field survey had already been completed by this time, this request could not be accommodated; however,

the City arranged for UAIC to monitor during Extended Phase 1 (XP1) fieldwork (described below). On July 19, 2016, a copy of all technical reports was sent to the UAIC.

A letter was sent to the Placer County Historical Society on July 29, 2014 to request information on any historical resources located in or near the Project. No response has been received.

Archaeological Survey

On July 23 and 24, 2014, archaeologists conducted a field survey of the entire project site. The survey consisted of walking systematic parallel transects spaced 15 meters apart. The ground surface was examined for indications of surface or subsurface cultural resources. The general morphological characteristics of the ground surface were inspected for indications of subsurface deposits that may be manifested on the surface, such as circular depressions or ditches. Whenever possible, the locations of subsurface exposures caused by factors such as rodent activity, water or soil erosion, or vegetation disturbances were examined for artifacts or for indications of buried deposits.

The one previously recorded resource, the historic-period concrete building foundation (P-31-788), was not able to be located during the survey; based on recent and extensive road construction it appears that the resource was removed or demolished at some point. One feature was encountered during the survey (Dry-001), a concrete-encased sewer line; however this feature was determined not to meet the minimum requirements, as outlined in Attachment 4 of the Caltrans FHWA Section 106 Programmatic Agreement, and therefore the feature was not recorded or evaluated.

Following the field survey and preparation of an archaeological survey report, an XP1 study was conducted to better understand the potential for buried subsurface archaeological deposits along Dry Creek. Field work for the XP1 was performed by qualified archaeologists in March 2016 within the project site. Testing was focused on portions of the project site where deep excavation would occur (within constructed project facilities such as bridge abutments, culverts, and gabion basket walls). Subsurface testing was initiated by placing spiral manual auger holes at 20 locations where deep excavations would occur to install project facilities. The auger holes were excavated to investigate the presence or absence of archaeological deposits. Each auger hole consisted of a circular hole approximately 10 cm (4 inches) in diameter and was excavated in arbitrary 10- to 20-cm levels to depths of at least 40 to 60 cm, where feasible. Soil was then processed through 1/8-inch hardware mesh screens. A total of 53 spiral manual auger holes were excavated.

No buried cultural materials were found in any of the auger holes, which indicates that there is a low potential for archaeological sites present beneath the areas where deep ground disturbance would occur. The uniformity of soil type throughout the XP1 study area also indicates that there is a low potential for buried deposits throughout the project site as no midden or cultural material was observed in any of the auger holes. Furthermore, sites recorded within the vicinity of the project site exhibit surface manifestations, and therefore, any sites within the project site would be expected to be visible on the surface. Because no indications of buried archaeological sites were observed within the XP1 study area, there is a low potential for subsurface deposits throughout the project site.

4.4.3 Regulatory Setting

Cultural 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

Section 106 of the National Historic Preservation Act

Federal protection of cultural resources is legislated by (a) the National Historic Preservation Act of 1966 as amended by 16 U.S. Code 470, (b) the Archaeological Resource Protection Act of 1979, and (c) the Advisory Council on Historical Preservation. These laws and organizations maintain processes for determination of the effects on historical properties eligible for listing in the National Register of Historic Places (NRHP).

Section 106 of the National Historic Preservation Act and accompanying regulations (36 Code of Federal Regulations [CFR] Part 800) constitute the main federal regulatory framework guiding cultural resources investigations and requires consideration of effects on properties that are listed in, or may be eligible for listing in the NRHP. The NRHP is the nation's master inventory of known historic resources. It is administered by the National Park Service and includes listings of buildings, structures, sites, objects, and districts that possess historic, architectural, engineering, archaeological, and cultural value.

The formal criteria (36 CFR 60.4) for determining NRHP eligibility are as follows:

1. The property is at least 50 years old (however, properties under 50 years of age that are of exceptional importance or are contributors to a district can also be included in the NRHP);

2. It retains integrity of location, design, setting, materials, workmanship, feeling, and associations; and

3. It possesses at least one of the following characteristics:

    a. Association with events that have made a significant contribution to the broad patterns of history (events).

    b. Association with the lives of persons significant in the past (persons).

    c. Distinctive characteristics of a type, period, or method of construction, or represents the work of a master, or possesses high artistic values, or represents a significant, distinguishable entity whose components may lack individual distinction (architecture).

    d. Has yielded, or may be likely to yield, information important to prehistory or history (information potential).

STATE

California Register of Historical Resources

All properties listed in or formally determined eligible for listing in the NRHP are eligible for the CRHR. The CRHR is a listing of State of California resources that are significant within the context of California's history. The CRHR is a statewide program of similar scope and with similar criteria for inclusion as those used for the NRHP. In addition, properties designated under municipal or county ordinances are also eligible for listing in the CRHR.

A historic resource must be significant at the local, state, or national level under one or more of the criteria defined in the California Code of Regulations (CCR) Title 15, Chapter 11.5, Section 4850. The CRHR criteria are similar to the NRHP criteria and are tied to CEQA because any resource that meets the criteria below is considered a historical resource under CEQA. As noted above, all resources listed in or formally determined eligible for the NRHP are automatically listed in the CRHR.

The CRHR uses four evaluation criteria for listing eligibility of a resource to the CRHR:

1. Is associated with events or patterns of events that have made a significant contribution to the broad patterns of local or regional history, or the cultural heritage of California or the United States.

2. Is associated with the lives of persons important to local, California, or national history.

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of a master, or possesses high artistic values.

4. Has yielded, or has the potential to yield, information important to the prehistory or history of the local area, California or the nation.

Similar to the NRHP, a resource must meet one of the above criteria and retain integrity. The CRHR uses the same seven aspects of integrity as the NRHP.

California Environmental Quality Act

CEQA requires public agencies to consider the effects of their actions on both "historical resources" and "unique archaeological resources." Pursuant to Public Resources Code (PRC) Section 21084.1, a "project that may cause a substantial adverse change in the significance of an historical resource is a project that may have a significant effect on the environment." Section 21083.2 requires agencies to determine whether proposed projects would have effects on unique archaeological resources.

Historical Resources

"Historical resource" is a term with a defined statutory meaning (PRC, Section 21084.1; determining significant impacts to historical and archaeological resources is described in the State CEQA Guidelines, Sections 15064.5[a] and [b]). Under State CEQA Guidelines Section 15064.5(a), historical resources include the following:

1. A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Public Resources Code, Section 5024.1).

2. A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the Public Resources Code, will be presumed to be historically or culturally significant. Public agencies must treat any such resource as significant unless the preponderance of evidence demonstrates that it is not historically or culturally significant.

3. Any object, building, structure, site, area, place, record, or manuscript which a lead agency determines to be historically significant or significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California may be considered to be a historical resource, provided the lead agency's determination is supported by substantial evidence in light of the whole record. Generally, a resource will be considered by the lead agency to be historically significant if the resource meets the criteria for listing in the California Register of Historical Resources (Public Resources Code, Section 5024.1), including the following:

    a. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

    b. Is associated with the lives of persons important in our past;

    c. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

d. Has yielded, or may be likely to yield, information important in prehistory or history.

4. The fact that a resource is not listed in or determined to be eligible for listing in the California Register of Historical Resources, not included in a local register of historical resources (pursuant to Section 5020.1(k) of the Public Resources Code), or identified in a historical resources survey (meeting the criteria in Section 5024.1(g) of the Public Resources Code) does not preclude a lead agency from determining that the resource may be an historical resource as defined in PRC Section 5020.1(j) or 5024.1.

Unique Archaeological Resources

CEQA also requires lead agencies to consider whether projects will impact unique archaeological resources. Public Resources Code Section 21083.2, subdivision (g), states that unique archaeological resource means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

California Native American Historical, Cultural, and Sacred Sites Act

The California Native American Historical, Cultural, and Sacred Sites Act applies to both State and private lands. The Act requires that upon discovery of human remains, construction or excavation activity cease and the county coroner be notified. If the remains are of a Native American, the coroner must notify NAHC. The NAHC then notifies those persons most likely to be descended from the Native American's remains. This act stipulates the procedures the descendants may follow for treating or disposing of the remains and associated grave goods.

California Health and Safety Code

Section 7052 of the Health and Safety Code states that the disturbance of Native American cemeteries is a felony. Section 7050.5 requires that construction or excavation be stopped in the vicinity of discovered human remains until the coroner can determine whether the remains are those of a Native American. If determined to be Native American, the coroner must contact the California NAHC. Section 7050.5 (b) of the California Health and Safety code specifies protocol when human remains are discovered. The code states:

> In the event of discovery or recognition of any human remains in any location other than a dedicated cemetery, there shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent remains until the coroner of the county in which the human remains are discovered has determined, in accordance with Chapter 10 (commencing with Section 27460) of Part 3 of Division 2 of Title 3 of the Government Code, that the remains are not subject to the provisions of Section 27492 of the Government Code or any other related provisions of law concerning investigation of the circumstances, manner and cause of death, and the recommendations concerning treatment and disposition of the human remains have been made to the person responsible for the excavation, or to his or her authorized representative, in the manner provided in Section 5097.98 of the Public Resources Code.

Public Resource Code, Section 5097

PRC Section 5097 specifies the procedures to be followed in the event of the unexpected discovery of human remains on nonfederal land. The disposition of Native American burial falls within the jurisdiction of the NAHC. Section 5097.5 of the Code states the following:

> No person shall knowingly and willfully excavate upon, or remove, destroy, injure, or deface any historic or prehistoric ruins, burial grounds, archaeological or vertebrate paleontological site, including fossilized footprints, inscriptions made by human agency, or any other archaeological, paleontological or historical feature, situated on public lands, except with the express permission of the public agency having jurisdiction over such lands. Violation of this section is a misdemeanor.

ASSEMBLY BILL 52

Assembly Bill (AB) 52, signed by Governor Edmund G. Brown, Jr., in September of 2014, establishes a new class of resources under CEQA: "tribal cultural resources." It requires that lead agencies undertaking CEQA review must, upon written request of a California Native American tribe, begin consultation once the lead agency determines that the application for the project is complete, prior to the issuance of an NOP of an EIR or notice of intent to adopt a negative declaration or mitigated negative declaration. AB 52 also requires revision to CEQA Appendix G, the environmental checklist. This revision would create a new category for "tribal cultural resources."

The procedural requirements for tribal consultation in AB 52 applies to those projects for which a lead agency has issued an NOP of an EIR or notice of intent to adopt a negative declaration or mitigated negative declaration on or after July 1, 2015. Because the NOP for the proposed project was issued on November 18, 2013, the consultation requirements of AB 52 do not apply. Nonetheless, as described previously in this section (see Native American Consultation and Other Interested Parties, above), the City of Roseville reached out to tribes and attempted communication with the T'si-Akim Maidu, who had requested to participate in project construction monitoring. The analysis addresses known and potential unknown cultural resources, including potential tribal cultural resources, which include as qualifying criteria listing on the state register or a local register, or a determination by the lead agency that an unlisted resource would be eligible for listing. None of the cultural resources identified in the EIR analysis meet these criteria, so no known tribal cultural resources are present in the project site. However, this requirement will apply to future projects where CEQA review is necessary.

LOCAL

City of Roseville General Plan

The Open Space and Conservation Element contains the following goal related to archaeological, historic, and cultural resources.

GOAL 1: Strengthen Roseville's unique identify through the protection of its archaeological, historic and cultural resources.

- **Policy 1:** When items of historical, cultural or archaeological significance are discovered within the City, a qualified archaeologist or historian shall be called to evaluate the find and to recommend proper action.
- **Policy 2:** When feasible, incorporate significant archaeological sites into open space areas.
- **Policy 3:** Subject to approval by the appropriate federal, state, local agencies, and Native American Most Likely Descendant (MLD), artifacts that are discovered and subsequently determined to be "removable" should be offered for dedication to the Maidu Interpretive Center.

4.4.4 Impacts

METHODS OF ANALYSIS

The impact analysis for prehistoric and historic-period archaeological resources is based on the findings and recommendations of the report titled *Archeological Survey Report for the Dry Creek Greenway Multi-Use Trail Project*, prepared by ECORP Consulting, Inc. (2014), and the *Dry Creek Greenway Multi-Use Trail Project Extended Phase I Report*, prepared by ECORP Consulting, Inc. (2016). The analysis is also informed by the provisions and requirements of federal, state, and local laws and regulations that apply to cultural resources. See the discussion above under "Archaeological Survey" for a description of the field surveys conducted for the proposed project.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the proposed project was determined to result in a significant impact to cultural resources if it would:

- cause a substantial adverse change in the significance of an historical resource as defined in Section 15064.5 of the CEQA Guidelines;
- cause a substantial adverse change in the significance of an archaeological resource as defined in Section 15064.5 of the CEQA Guidelines;
- disturb any human remains, including those interred outside of formal cemeteries; or
- cause a substantial adverse change in the significance of a tribal cultural resource as defined in PRC Section 21074.

ISSUES OR POTENTIAL IMPACTS NOT DISCUSSED FURTHER

No historic architectural resources were identified on the project site because no buildings of historic-age were identified on the project site. Therefore, project construction and use would have no impact on historical resources, and this issue is not discussed further in this EIR.

IMPACT ANALYSIS

Impact 4.4-1	Disturb archaeological resources, including tribal cultural resources.
Applicable Policies and Regulations	Section 106 of the National Historic Preservation Act CEQA pursuant to PRC 21083.2 California Register of Historical Resources California Native American Historical, Cultural, and Sacred Sites Act City of Roseville General Plan Open Space and Conservation Element
Significance with Policies and Regulations	Proposed Project: Potentially significant Alignment Option 1A: Potentially significant Alignment Option 1C: Potentially significant Alignment Option 5A: Potentially significant
Mitigation Measures	Mitigation Measure 4.4-1 (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

The project is a 4.25-mile multi-use trail that would follow creek corridors along portions of Dry, Cirby, and Linda Creeks. The multi-use trail would generally consist of a 10-foot wide paved trail with two-foot wide shoulders. The project would also include the construction of up to eight bridges to provide creek crossings along with areas of bank stabilization.

No new cultural resources were recorded during the field survey of the project site. One feature was encountered during the survey (Dry-001), a concrete-encased sewer line; however, this feature was determined not to meet Caltrans' minimum requirements; therefore, the feature is not considered to be an historical or unique archaeological resource. Disturbing it would not be significant for the purposes of CEQA. Previously recorded site P-31-788 was not relocated during the survey.

Following the field survey and preparation of an archaeological survey report, an XP1 was performed to better understand the potential for buried subsurface archaeological deposits along Dry Creek within the project site. Excavation was focused on portions of the project site where deep excavation will occur (within constructed project facilities such as bridge abutments, culverts, and gabion basket walls), and a total of 53 spiral manual auger holes were excavated. As a result of the study, no buried cultural material was found in the auger holes and the uniformity of soil type throughout the study area also indicates that there is a low potential for buried deposits throughout the project site. Furthermore, sites recorded within the vicinity of the study area exhibit surface manifestations, and therefore, any sites within the project site would be expected to be visible on the surface. Because no indications of buried archaeological sites were observed within the study area, there is a low potential for subsurface deposits throughout the project site.

Based on the findings of the background research, records searches, and the results of the XP1 study, the project site has low sensitivity for prehistoric and historic-era archaeological resources. No evidence of a potential tribal cultural resources was found. Nonetheless, project construction could encounter previously undiscovered or unrecorded archaeological sites and materials during project-related preconstruction or construction-related ground disturbing activities, such as removing existing vegetation from the project site (i.e., trail footprint and construction zone), excavation and contouring to establish the trail bed, or excavation for retaining wall footings and bridge abutments. These activities could damage or destroy previously undiscovered archaeological resources.

Use-related Impacts

The proposed project is a multi-use bike trail and use of the project would consist primarily of pedestrian and bicycle users, although occasional utility access or emergency vehicle use is also expected. Uses would generally be confined to the paved trail and would not include grading, excavation, or other earth-moving activities.

Conclusion

The XP1 study focused the 53 auger tests throughout the project site where deep excavation would occur and found no buried cultural material and, therefore, concluded there is a low potential for subsurface deposits throughout the project site. While the depth, type, and location of project construction activities would have no impact on the likelihood of such a discovery, because the XP1 found no cultural material to indicate locational probability, it is possible that project construction could result in the disturbance or discovery of previously undiscovered or unrecorded archaeological sites and materials. If such resources were to represent "unique archaeological resources" or "tribal cultural resources" as defined by CEQA, any substantial change to, or destruction of, these resources would be a potentially significant impact. For these reasons, the project could result in the damage or destruction of an as yet undiscovered archaeological resource; therefore, this would be a **potentially significant** impact.

Alignment Option 1A
Construction activities under Alignment Option 1A would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment. Alignment Option 1A would begin north of Darling Way and would travel on the west side of Dry Creek. At the confluence of Dry Creek and Cirby Creek, this option would cross to the south side of Dry Creek and travel along the south side of Cirby Creek as the trail heads upstream.

As discussed above under the Proposed Trail Alignment, excavation and other ground-disturbing activities could damage or destroy as yet undiscovered archaeological resources. If such resources were to represent or "unique archaeological resources" or "tribal cultural resources" as defined by CEQA, this would be a **potentially significant** impact.

Alignment Option 1C
Construction activities under Alignment Option 1C would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment. Alignment Option 1C would begin north of Darling Way and would travel on the east side of Dry Creek before crossing to the south side of Cirby Creek upstream of the confluence with Cirby Creek.

As discussed above under the Proposed Trail Alignment, excavation and other ground-disturbing activities could damage or destroy as yet undiscovered archaeological resources. If such resources were to represent or "unique archaeological resources" or "tribal cultural resources" as defined by CEQA, this would be a **potentially significant** impact.

Alignment Option 5A
Construction activities under Alignment Option 5A would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment. East of Eastwood Park, Alignment Option 5A would remain on the south side of Linda Creek until east of Sunrise Avenue before crossing to the north side of the creek.

As discussed above under the Proposed Trail Alignment, excavation and other ground-disturbing activities could damage or destroy as yet undiscovered archaeological resources. If such resources were to represent or "unique archaeological resources" or "tribal cultural resources" as defined by CEQA, this would be a **potentially significant** impact.

Mitigation Measures

Mitigation Measure 4.4-1: Proper Handling of Archaeological Resources.
This mitigation would apply for the Proposed Trail Alignment, Alignment Options 1A, 1C, and 5A.

A minimum of seven days prior to beginning earthwork or other soil disturbance activities, the City shall notify UAIC of the proposed earthwork start-date. As part of this notification, a UAIC tribal representative shall be invited to inspect the project site, including any soil piles, trenches, or other disturbed areas, within the first five days of groundbreaking activity. During this inspection, a site meeting of construction personnel shall also be held to afford the tribal representative the opportunity to provide cultural resources awareness information. If any cultural resources, such as structural features, unusual amounts of bone or shell, artifacts, human remains, or architectural remains are encountered during this initial inspection or during any subsequent construction activities, work shall be suspended within 100 feet of the find, and the City's Project Manager shall immediately notify the City of Roseville Development Services Director. The City's Project Manager, in consultation with the City's Environmental Coordinator, shall coordinate any necessary investigation of the site with a qualified archaeologist approved by the City, and as part of the site investigation and resource assessment the archeologist shall consult with the UAIC and provide proper management recommendations should potential impacts to the resources be found by the City to be significant. A written report detailing the site assessment, coordination activities, and management recommendations shall be provided to the City by the qualified archaeologist. Possible management

recommendations for unique archaeological resources could include resource avoidance or, where avoidance is infeasible in light of project design or layout or is unnecessary to avoid significant effects, preservation in place or other measures. The contractor shall implement any measures deemed by City staff to be necessary and feasible to avoid or minimize significant effects to the cultural resources.

Significance after Mitigation
Implementation of Mitigation Measure 4.4-1 would reduce impacts associated with archaeological resources to a **less-than-significant** level because it would require the performance of professionally accepted and legally compliant procedures for the discovery of previously undocumented significant archaeological resources.

Impact 4.4-2	Accidental discovery of human remains.
Applicable Policies and Regulations	California Health and Safety Code Sections 7050.5 and 7052 California Public Resources Code Section 5097 California Native American Historical, Cultural and Sacred Sites Act City of Roseville General Plan Open Space and Conservation Element
Significance with Policies and Regulations	Proposed Project: Potentially significant Alignment Option 1A: Potentially significant Alignment Option 1C: Potentially significant Alignment Option 5A: Potentially significant
Mitigation Measures	Mitigation Measure 4.4-2 (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
The project is a 4.25-mile multi-use trail that would follow creek corridors along portions of Dry, Cirby, and Linda Creeks. The multi-use trail would consist of a 10-foot wide paved trail with two-foot wide shoulders. The project would also include the construction of up to eight bridges to provide creek crossings along with areas of bank stabilization.

Based on documentary research, no evidence suggests that any prehistoric or historic-era marked or un-marked human interments are present within or in the immediate vicinity of the project site. However, there is a possibility that unmarked, previously unknown Native American or other graves could be present within the project site and could be uncovered by project-related construction activities. The location of grave sites and Native American remains can occur outside of identified cemeteries or burial sites. Construction of the proposed multi-use trail would require removal of vegetation and existing features, grading, construction of five roadway undercrossings, and construction or modification of up to eight bridges. These construction activities would create ground disturbance that could uncover previously unknown human remains.

Use-related Impacts
The proposed project is a multi-use bike trail and use of the project would occur primarily by pedestrians and bicyclists, although occasional utility access or emergency vehicle use is also expected. Uses would be generally confined to the paved trail and would not include grading, excavation, or other earth-moving activities.

Conclusion

Although there are no known prehistoric or early historic interments on the project site, project-related construction activities could uncover or otherwise disturb previously undiscovered or unrecorded human remains. Disturbance of human remains would be a **potentially significant** impact.

Alignment Option 1A

Construction activities under Alignment Option 1A would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment. Alignment Option 1A would begin north of Darling Way and would travel on the west side of Dry Creek. At the confluence of Dry Creek and Cirby Creek, this option would cross to the south side of Dry Creek and travel along the south side of Cirby Creek as the trail heads upstream.

As discussed above under the Proposed Trail Alignment, although there are no known prehistoric or early historic interments on the project site, project-related construction activities could uncover or otherwise disturb previously undiscovered or unrecorded human remains. Disturbance of human remains would be a **potentially significant** impact.

Alignment Option 1C

Construction activities under Alignment Option 1C would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment. Alignment Option 1C would begin north of Darling Way and would travel on the east side of Dry Creek before crossing to the south side of Cirby Creek upstream of the confluence with Cirby Creek.

As discussed above under the Proposed Trail Alignment, although there are no known prehistoric or early historic interments on the project site, project-related construction activities could uncover or otherwise disturb previously undiscovered or unrecorded human remains. Disturbance of human remains would be a **potentially significant** impact.

Alignment Option 5A

Construction activities under Alignment Option 5A would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment. East of Eastwood Park, Option 5A would remain on the south side of Linda Creek until east of Sunrise Avenue before crossing to the north side of the creek.

As discussed above under the Proposed Trail Alignment, although there are no known prehistoric or early historic interments on the project site, project-related construction activities could uncover or otherwise disturb previously undiscovered or unrecorded human remains. Disturbance of human remains would be a **potentially significant** impact.

Mitigation Measures

Mitigation Measure 4.4-2: Stop work if human remains are discovered.

This mitigation would apply for the Proposed Trail Alignment, Alignment Options 1A, 1C, and 5A.

If human remains are discovered during any construction activities, potentially damaging ground-disturbing activities in the area of the remains shall be halted immediately, and the project applicant shall notify the Placer County coroner and the NAHC immediately, according to Section 5097.98 of the State Public Resources Code and Section 7050.5 of California's Health and Safety Code. If the remains are determined by the NAHC to be Native American, the guidelines of the NAHC shall be adhered to in the treatment and disposition of the remains. The City shall also retain a professional archaeologist with Native American burial experience to conduct a field investigation of the specific site and consult with the MLD, if any, identified by the NAHC. Following the coroner's and NAHC's findings, the archaeologist, and the NAHC-designated MLD shall determine the ultimate treatment and disposition of the remains and take appropriate steps to ensure that additional human interments are not disturbed. The responsibilities

for acting upon notification of a discovery of Native American human remains are identified in California Public Resources Code Section 5097.94.

Significance after Mitigation

Implementation of Mitigation Measure 4.4-2 would reduce potentially significant impacts related to disturbance of human remains, because actions would be implemented to avoid, move, record, or otherwise treat the remains appropriately, in accordance with pertinent laws and regulations. By providing an opportunity to avoid or minimize the disturbance of human remains, and to appropriately treat any remains that are discovered, this impact would be reduced to a **less-than-significant** level.

4.5 GEOLOGY AND SOILS

4.5.1 Introduction

This section identifies and evaluates potential impacts that could result from geologic or soil conditions as a result of implementation of the Dry Creek Greenway East Trail. This section is based primarily on the *Dry Creek Greenway Trail Fluvial Audit* (City of Roseville and Psomas 2014) and the *Preliminary Geotechnical Evaluation, Dry Creek Greenway Multi-Use Trail Project, City of Roseville, CA* (Parikh 2015), as well as the *Engineering Design Considerations and Evaluation based on Geomorphology Study* (Psomas 2014).

No comments related to geology and soils were received during public review of the Notice of Preparation.

4.5.2 Environmental Setting

REGIONAL SETTING

The project site is located in the Great Valley geomorphic province, which consists of the central part of California between the Coast Range and the Sierra Nevada. The Great Valley is an alluvial plain that is approximately 50 miles wide and 400 miles long where sediment has been deposited almost continually for roughly 160 million years. The proposed project would be located in the northern part of the Great Valley, which is drained by the Sacramento River (California Geological Survey [CGS] 2002).

LOCAL SETTING

Geology

The geology of the area consists of transitional formations between alluvial deposits of the valley and volcanic material of the Sierra Nevada. The City of Roseville is characterized by flat and rolling terrain, as well as rounded knolls and ridges separated by intermittent streams. Pleasant Grove Creek and its tributaries are the primary surface water drainages in northern Roseville; Dry Creek and its tributaries are the primary surface water drainages in southern Roseville. The area slopes gently westward toward the Sacramento River.

Subsurface conditions are mapped by CGS as alluvium deposited in the Holocene (i.e., between 11,700 years ago and the present time) along Dry Creek and Pleistocene-age (i.e., from about 2,588,000 to 11,700 years ago) alluvial deposits classified in the Modesto Formation and Turlock Lake Formation along Cirby and Linda Creeks. Samples indicate that subsurface soils are generally loose, granular (i.e., sandy or silty) materials within 10 to 20 feet of the surface that increase in density with depth. Groundwater is anticipated to fluctuate, but to generally be at or above creek level (Parikh 2015).

Paleontological Setting

Significant nonrenewable vertebrate and invertebrate fossils and unique geologic units have been documented throughout California. The fossil-yielding potential of a particular area is highly dependent on the geologic age and origin of the underlying rocks (refer to geologic timescale in Table 4.5-1). Paleontological potential refers to the likelihood that a rock unit will yield a unique or significant paleontological resource. All sedimentary rocks, some volcanic rocks, and some low-grade metamorphic rocks have potential to yield paleontological resources. Depending on location, the

paleontological potential of subsurface materials generally increases with depth beneath the surface, as well as with proximity to known fossiliferous deposits.

Table 4.5-1 Divisions of Geologic Time

Era	Period	Time in Millions of Years Ago (approximately)	Epoch
Cenozoic	Quaternary	< 0.01	Holocene
		2.6	Pleistocene
	Tertiary	5.3	Pliocene
		23	Miocene
		34	Oligocene
		56	Eocene
		65	Paleocene
Mesozoic	Cretaceous	145	
	Jurassic	200	
	Triassic	251	
Paleozoic	Permian	299	
	Carboniferous	359	
	Devonian	416	
	Silurian	444	
	Ordovician	488	
	Cambrian	542	
Precambrian		2,500	

Source: U.S. Geological Survey 2010

Pleistocene or older (older than 11,000 years) continental sedimentary deposits are considered as having a high paleontological potential while Holocene-age deposits (less than 10,000 years old) are generally considered to have a low paleontological potential because they are geologically immature and are unlikely to have fossilized the remains of organisms. Metamorphic and igneous rocks have a low paleontological potential, either because they formed beneath the surface of the earth (such as granite), or because they have been altered under high heat and pressures, chaotically mixed or severely fractured. Generally, the processes that form igneous and metamorphic rocks are too destructive to preserve identifiable fossil remains.

The project site is located in the Great Valley geomorphic province, consisting of the central part of California between the Coast Range and the Sierra Nevada. The Great Valley is an alluvial plain that is approximately 50 miles wide and 400 miles long where sediment has been deposited almost continually for roughly 160 million years. The proposed project site is located in the northern part of the Great Valley, which is drained by the Sacramento River (CGS 2002). Geology in the area consists of transitional formations between alluvial deposits of the central valley and volcanic material of the Sierra Nevada.

Subsurface conditions are mapped by CGS as alluvium deposited in the Holocene (i.e., between 11,700 years ago and the present time) along Dry Creek and Pleistocene-age (i.e., from about 2,588,000 to 11,700 years ago) alluvial deposits classified in the Modesto Formation and Turlock Lake Formation along Cirby and Linda Creeks. Recognizing the age of alluvial soils, the potential exists to encounter paleontological resources. Samples indicate that subsurface soils are generally loose,

granular (i.e., sandy or silty) materials within 10 to 20 feet of the surface that increase in density with depth (Parikh 2015).

Faults and Seismicity

Seismically-induced ground rupture, the physical displacement of surface deposits in response to an earthquake's seismic waves, is considered most likely along faults that have a record of displacement sometime in the past 11,000 years (the Holocene Epoch). These faults are considered active. Faults on which an event is believed to have occurred during the Quaternary time (approximately the last 1.6 million years) are considered potentially active. All other faults are considered inactive.

The nearest known active fault is the Cleveland Hill Fault, located approximately 41 miles north of Roseville. The Dunnigan Hills and Midland faults, which both have unknown histories of activity and are located approximately 13 and 19 miles from the City of Roseville, respectively, present the highest potential to produce ground shaking at the project site. Ground shaking could also originate from seismic activity along the larger, but relatively distant Foothill or San Andreas fault systems, the nearest components of which are approximately 20 and 55 miles away from the City of Roseville, respectively (City of Roseville 2010).

There are also three inactive faults located near Roseville: the Volcano Hill fault, the Linda Creek fault, and one unnamed fault. The Volcano Hill fault is located northwest of Volcano Hill and extends northwesterly for approximately 1 mile starting just east of the city limits. The Linda Creek fault, the existence of which is disputed because of lack of recorded activity, is suspected to extend along a portion of Linda Creek through Roseville and a portion of Sacramento County. The unnamed fault extends in an east-west direction between Folsom Lake and the City of Rocklin. Portions of this unnamed fault are concealed, and it is possible that the fault is connected to the Bear Mountain Fault near Folsom Lake (City of Roseville 2010: 12-7).

Ground Shaking

Ground shaking is a general term referring to all aspects of motion of the earth's surface resulting from an earthquake, and is normally the major cause of damage in seismic events. The extent of ground shaking is controlled by the magnitude and intensity of the earthquake, distance from the epicenter, and local geologic conditions.

There is a 25 percent probability of an earthquake of greater than 5.0 magnitude occurring within the next 50 years on the project site due to nearby faults (U.S. Geological Survey 2009). An earthquake that registers 5.0 on the Richter magnitude scale (which is used to quantify the energy released by an earthquake) is of moderate intensity and would be widely felt but would not cause damage to buildings unless they are poorly constructed. The last nearby seismic event measuring at least 4.0 on the Richter scale occurred between Placerville and Roseville in 1908 on a north-south fault line between Folsom and Auburn (City of Roseville 2010:12-3). No significant seismic event has been recorded since that time within the vicinity of Roseville, and the South Placer area is classified as a low severity earthquake zone. No Alquist-Priolo Earthquake Fault Zones are located in the City of Roseville or in Placer County (CGS 2010).

Liquefaction and Lateral Spreading

Soil liquefaction is caused by pressure waves moving through the ground because of earthquakes. Loose, granular soils and non-plastic silts that are saturated by relatively shallow groundwater (generally less than 50 feet) are susceptible to liquefaction. Liquefaction causes soil to lose strength and "liquefy," triggering structural distress or failure because of the dynamic settlement of the ground or a loss of strength in the soils underneath structures. Liquefaction in a subsurface layer can in turn cause lateral spreading of the ground surface, which usually takes place along weak shear zones that have formed within the liquefiable soil layer.

Seismic Hazard Zones are regulatory zones mapped by CGS that encompass areas prone to liquefaction and earthquake-induced landslides. The CGS has not mapped the project site as a Seismic Hazard Zone; this indicates that the risk for liquefaction is low. However, based on review of the area geology and existing boring data, the preliminary geotechnical evaluation identified the potential for liquefaction in the project area because of the presence of sandy and granular soils, and the expectation of loose sand along the creeks (Parikh 2015:4).

Slope Failure

Slope failures, commonly referred to as landslides, include many phenomena that involve the downslope displacement and movement of material, triggered either by static (i.e., gravity) or dynamic (i.e., earthquake) forces. Soil slopes can experience soil slumps, rapid debris flows, and deep-seated rotational slides. Landslides can occur on slopes of 15 percent or less, but the probability is greater on steeper slopes. Slope stability can depend on a number of complex variables, including the geology, structure, and amount of groundwater, as well as external processes such as climate, topography, slope geometry, and human activity. Overall, the risk of landslides within and adjacent to the project site caused by seismic events or project activities is low.

Soil Characteristics

Soils in the Roseville area are generally associated with stream terraces and alluvial bottoms. These soils are typically deep and well drained, have low permeability, low shrink-swell potential, and low soil strength.

Table 4.5-2 provides a list of the soil map units identified by the Natural Resources Conservation Service (NRCS) as occurring within the project area. As indicated in Exhibit 4.5-1, most of the project site is characterized by xerofluvents (coarse textured stream deposits) that are occasionally or frequently flooded. These soils have moderate shrink-swell potential and low to moderate susceptibility to erosion. Staging areas and access ways are characterized by Cometa-Ramona sandy loams, Fiddyment loam, and cut and fill areas.

Table 4.5-2 Characteristics of Soils on the Project Site

Soil Map Unit Name	Shrink-Swell Potential[1]	Water Erosion Hazard[2]	Wind Erosion Hazard[3]	% of Total Project Site
Cometa-Fiddyment complex, 1 to 5% slopes	1.5	0.49	3	0.1
Cometa-Ramona sandy loams, 1 to 5% slopes	1.5	0.32	3	1.6
Fiddyment loam, 1 to 8% slopes	1.5	0.49	5	5.6
Urban land-Xerarents-Fiddyment complex, 0 to 8% slopes	-	-	-	0.1
Xerofluvents, frequently flooded	4.5	0.32	3	76.9
Xerofluvents, occasionally flooded	4.5	0.32	2	13.2
Xerorthents, cut and fill areas	-	-	-	2.6

Notes:

[1] Based on percentage of linear extensibility (i.e., the change in length of an unconfined clod as moisture content is decreased from a moist to a dry state). Linear extensibility of less than 3 indicates a low shrink-swell potential, 3 to 6 is associated with moderate potential,6 to 9 is associated with high potential, and over 9 is very high potential for shrink-swell conditions. Ratings over 3 are associated with damage buildings, roads, and other structures

[2] Based on the erosion factor "Kw," which indicates the erodibility of the whole soil (i.e., modified for the presence of rock fragments). The K factor is a measurement of relative soil susceptibility to sheet and rill erosion by water. Values range from 0.02 to 0.69; higher values are more susceptible to erosion.

[3] Based on the wind erodibility group designated by NRCS. The soils assigned to group 1 are the most susceptible to wind erosion, and those assigned to group 8 are the least susceptible.

Source: NRCS 2015

Exhibit 4.5-1

Soils

ASCENT ENVIRONMENTAL

Expansive Soils

Expansive soils contain substantial amounts of clay particles that have the ability to give up water (shrink) or take on water (swell). When these soils swell, the change in volume can exert pressures on loads that are placed on them, such as building and structure foundations or underground utilities, and can result in structural distress and/or damage. Often, grading, site preparations, and backfill operations associated with subsurface structures can eliminate the potential for expansion. Xerofluvents in areas that experience flooding, which comprise approximately 86.9 percent of the project site, are moderately expansive.

Erosion and Runoff

Erosion is a natural process whereby soil and highly-weathered rock materials are worn away and transported, most commonly by wind or water. Natural rates of erosion can vary depending on slope, soil type, and vegetative cover. Soils containing high amounts of silt are typically more easily eroded, while coarse-grained (sand and gravel) soils are generally less susceptible to erosion.

Soil erosion can become problematic when human intervention causes rapid soil loss and the development of erosional features (e.g., incised channels, rills, and gullies) that undermine roads, buildings, or utilities. Vegetation clearing and earth moving reduces soil structure and cohesion, resulting in accelerated erosion. The operation of construction-related heavy machinery and vehicles over access roads, staging areas, and work areas could compact soils and decrease their capacity to absorb runoff, resulting in rills, gullies, and excessive sediment transport.

As indicated in Table 4.5-3, the soils on the project site are generally moderately susceptible to erosion. NRCS also classifies soil according to suitability and limitations for use, including roads and trails. This mapping, which is based on regional data, indicates that approximately 87 percent of the project site has a low erosion hazard when used for roads and trails, another 11 percent has a moderate hazard, and the remaining area is not rated. Additionally, site-specific bank erosion severity has been mapped for the project site. As summarized in Table 4.5-3, below, most of the creek banks have moderately severe bank erosion.

Table 4.5-3 Bank Erosion Severity in Project Site

Bank Erosion Severity	Length (Feet)	% of Total
Minor	284.59	16
Moderate	880.32	50
Moderate-High	361.51	21
High	222.92	13
Total (feet)	**1,749.34**	

Source: City of Roseville and PSOMAS 2014

4.5.3 Regulatory Setting

FEDERAL

National Pollutant Discharge Elimination System Program

Under Section 402 of the Clean Water Act, the National Pollutant Discharge Elimination System (NPDES) regulates point sources of pollution of waters of the United States. The California State Water Resources Control Board administers the NPDES permit program in California. Projects that disturb 1 acre or more

of soil must obtain coverage under the state's NPDES General Permit for Discharges of Storm Water Associated with Construction Activity. A stormwater pollution prevention plan (SWPPP) must be developed and implemented that provides specific construction-related best management practices (BMPs) to prevent soil erosion and loss of topsoil. The required components and BMPs commonly included in a SWPPP are described in greater detail in Section 4.8, "Hydrology and Water Quality."

STATE

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and published maps showing these zones. The project site is not located in an Alquist-Priolo Earthquake Fault Zone.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was developed to protect the public from the effects of strong ground shaking and other hazards caused by earthquakes. This act requires the State Geologist to delineate "zones of required investigation" (i.e., seismic hazard zones) where site investigations are required to determine the need for mitigation of potential liquefaction and/or earthquake-induced landslide. There are no Seismic Hazard Zone maps for Placer County.

LOCAL

City of Roseville General Plan

The General Plan Safety Element includes policies intended to address potential geology, soils, and seismic impacts. These policies are implemented through the Building Permit process (for structures) and the Design and Construction Standards. The specific goals and policies applicable to the proposed project are:

<u>Seismic and Geologic Hazards</u>
GOAL 1: Minimize injury and property damage because of seismic activity and geologic hazards.

- **Policy 3:** Minimize soil erosion and sedimentation by maintaining compatible land uses, suitable building designs, and appropriate construction techniques.
- **Policy 6:** Require contour grading, where feasible, and re-vegetation to mitigate the appearance of engineered slopes and to control erosion.

City of Roseville Design and Construction Standards

The City of Roseville's Design and Construction Standards (last amended in April of 2015) provide a reference to the City's requirements for the design and construction of civil improvement projects, which are to be dedicated to the public and accepted by the City for maintenance or operation, and to provide for coordinated development of those facilities to be used by and for the protection of the public.

City of Roseville Guidance for Stormwater Quality Best Management Practices

Control of construction site stormwater runoff is required by the NPDES stormwater permit that the SWRCB issued the City in 2004. The *Stormwater Quality BMP Guidance Manual for Construction* (City of Roseville 2011) is designed to facilitate compliance with the City's Stormwater Management Plan. See Section 4.8, "Hydrology and Water Quality," for additional discussion of SWPPP requirements and BMPs.

Roseville Multi-Hazard Mitigation Plan

The Roseville Multi-Hazard Mitigation Plan is intended to provide a long-term planning vision to reduce the impacts of future disasters from multiple hazards, including drought, earthquake, flood, landslide, severe weather, and fire hazard.

City of Roseville Emergency Operations Plan

The City of Roseville Emergency Operations Plan is designed to guide users through emergency preparedness, response, recovery, and mitigation in response to extraordinary emergency situations associated with various potential disasters, including earthquakes.

4.5.4 Impacts

METHODS OF ANALYSIS

Potential impacts related to geologic and soil resources resulting from project construction were determined through review of available soil and fault maps for the project area, including the City of Roseville General Plan, U.S. Department of Agriculture NRCS Soil Surveys, and geologic data produced by CGS. 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.

In addition, this analysis incorporates the findings of the *Dry Creek Greenway Trail Fluvial Audit* (City of Roseville and PSOMAS 2014) 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.

This assessment recognizes that bridge crossings and other areas with slope stability concerns would be designed with input from geotechnical professionals, based on existing data and supplemental geotechnical investigations, as appropriate. Special design features may include retaining walls with tie backs for added support and slope paving to reduce the potential for erosion. These elements would be designed and constructed to meet the California Department of Transportation’s (Caltrans) standard performance specifications.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the proposed project was determined to result in a significant impact related to geology and soils resources if it would:

- expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
  - rupture of a known earthquake fault, as delineated by the most recent Alquist-Priolo Earthquake Faulting Map issued by the State Geologist for the area or based on other substantial evidence of a known fault;
  - strong seismic ground shaking;
  - seismic-related ground failure, including liquefaction;
  - landslides;
- result in substantial soil erosion or the loss of topsoil;

- be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse;
- be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating a substantial risk to life or property;
- have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of wastewater; or
- directly or indirectly destroy a unique paleontological resource or site or unique geologic feature.

ISSUES OR POTENTIAL IMPACTS NOT DISCUSSED FURTHER

The proposed project would not include the construction or operation of restrooms, and the project would not include infrastructure to connect to the City of Roseville wastewater system, nor result in the need for septic tanks. Therefore, the potential for site soils to support septic tanks or alternative wastewater disposal systems is not evaluated in this section.

IMPACT ANALYSIS

Impact 4.5-1	Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides.
Applicable Policies and Regulations	City of Roseville Design and Construction Standards; Roseville Multi-hazard Mitigation Plan; City of Roseville Emergency Operations Plan
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

As noted in the environmental setting section above, the project site is not in an area where strong seismic ground shaking is anticipated. In addition, the potential for surface rupture is low because no active faults pass through the site. Geographic conditions, soil conditions, and surface terrain combine to minimize risk of major damage from landslides, subsidence, or other geologic hazards that could result from seismic activity and related natural forces in the City (City of Roseville 2013). Based on available geological and seismic data, the potential for strong ground shaking in the project area is moderate (Parikh 2015:3).

However, the site is predominantly composed of Xerofluvent soils, which could be subject to localized creep, slumping, and small landslides on over-steepened slopes, along incised drainages, and during periods of water saturation. Retaining walls, including gravity walls (reinforced concrete) and anchored walls (soil nail and tie back walls), are proposed at several locations where the proposed trail is located near an exposed bank or an area susceptible to slumping. The type and extent of the proposed retaining walls are shown in Table 3-3 in Chapter 3, “Project Description.”

Complete plans and specifications for the proposed multi-use trail would be submitted to the Public Works Engineering Division for review and approval prior to construction. Pursuant to Section 13 of the City of Roseville Design and Construction Standards, “Bikeways,” these plans would be based on soil tests taken at least every 1,000 feet along the trail alignment, or as directed by the City Engineer. The

structural section of the path would be designed to support a gross vehicular weight of 30,000 pounds where it would be used for access by maintenance or emergency vehicles.

The preliminary geotechnical evaluation indicates that, with information from these site-specific borings, the potential effects of liquefaction could be accommodated with implementation of standard design practices. Any effects of liquefaction potential would be considered in the structural design (Parikh 2015). Project elements, such as retaining walls, may be added or modified in the plans based on further geotechnical investigations.

Construction Impacts

The potential for a seismic event to result in a geologic hazard during construction is low because there is a lack of active faulting close enough to the project area to create a significant hazard. However, construction of the project would require excavation in an area with steep banks and loose, granular soils that could be susceptible to localized areas of slope failure. As discussed above, construction specifications would be developed for the project based on detailed soil testing and site specific geotechnical engineering.

Use-related Impacts

The project would not include any occupied structures, and trail design would include features, such as retaining walls, to provide support where bank cuts would occur below existing structures. This would reduce the exposure of the trail and bridges, along with people recreating on the trail, to loss or injury during a seismic event.

Conclusion

With the adoption of construction practices consistent with the City's Design and Construction Standards, and the incorporation of design features to prevent localized creep, slumping, and small landslides, the potential effects of localized ground failure would be **less than significant**.

Alignment Option 1A

Implementation of this alignment would not substantially change the potential for the project to expose people or structures to substantial adverse effects associated with rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides because it is located in the same general area as the Proposed Trail Alignment and would require the same construction techniques, adhere to the same standards, and include the same type of bank stabilization elements. The impacts would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 1C

Implementation of this alignment would not substantially change the potential for the project to expose people or structures to substantial adverse effects associated with rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides because it is located in the same general area as the Proposed Trail Alignment and would require the same construction techniques, adhere to the same standards, and include the same type of bank stabilization elements. The impacts would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 5A

Implementation of this alignment would not substantially change the potential for the project to expose people or structures to substantial adverse effects associated with rupture of a known earthquake fault, strong seismic ground shaking, seismic-related ground failure, or landslides because it is located in the same general area as the Proposed Trail Alignment and would require the same construction techniques, adhere to the same standards, and include the same type of bank stabilization elements. The impacts would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Mitigation Measures

None required.

Impact 4.5-2	Result in substantial soil erosion or the loss of topsoil.
Applicable Policies and Regulations	RWQCB NPDES Permit; City of Roseville General Plan; City of Roseville Design and Construction Standards
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 potential for soil erosion is based on soil type and exposure to erosive forces. Table 4.5-4 summarizes the soil map units within the proposed project construction area. As discussed below, during construction the potential for erosion is mostly dependent on the disturbance of soil and loss of vegetation, which can expose soils to the erosive forces of wind and water runoff. During use, key areas of concern would be acceleration of erosion because of travel on the trail, and the potential hazards associated with ongoing streambank erosion.

Table 4.5-4 Acreage of Permanent and Temporary Impacts by Soil Map Unit

Alignment Option	Soil Type							Total (acres)
	Cometa-Fiddyment complex, 1-5% slopes	Cometa-Ramona sandy loams, 1-5% slopes	Fiddyment loam, 1-8% slopes	Urban land-Xerarents-Fiddyment complex, 0-8% slopes	Xerofluvents, frequently flooded	Xerofluvents, occasionally flooded	Xerorthents, cut and fill areas	
Proposed Trail Alignment	**0.07**	**0.60**	**1.47**	**-**	**19.48**	**3.80**	**0.95**	**26.37**
Permanent Impact	-	0.05	0.64	-	9.06	0.92	0.19	10.86
Temporary Impact	0.07	0.55	0.83	-	10.42	2.88	0.76	15.51
Comparison of Other Options Against Proposed Trail Alignment								
Option 1A	**0**	**0**	**0**	**+0.03**	**-0.64**	**-0.08**	**0**	**-0.69**
Permanent Impact	0	0	0	+0.03	-0.28	-0.04	0	-0.29
Temporary Impact	0	0	0	0	-0.36	-0.04	0	-0.40
Option 1C	**0**	**0**	**0**	**0**	**-0.51**	**+0.53**	**0**	**+0.02**
Permanent Impact	0	0	0	0	+0.24	+0.35	0	+0.59
Temporary Impact	0	0	0	0	-0.75	+0.18	0	-0.57

Table 4.5-4 Acreage of Permanent and Temporary Impacts by Soil Map Unit

Alignment Option	Soil Type							Total (acres)
	Cometa-Fiddyment complex, 1-5% slopes	Cometa-Ramona sandy loams, 1-5% slopes	Fiddyment loam, 1-8% slopes	Urban land-Xerarents-Fiddyment complex, 0-8% slopes	Xerofluvents, frequently flooded	Xerofluvents, occasionally flooded	Xerorthents, cut and fill areas	
Option 5A	**0**	**0**	**0**	**0**	**+0.83**	**-0.41**	**-0.07**	**+0.35**
Permanent Impact	0	0	+0.03	0	+0.51	-0.26	-0.06	+0.22
Temporary Impact	0	0	-0.03	0	+0.32	-0.15	-0.01	+0.13

Source: NRCS 2015

Construction Impacts

Construction of the proposed project would involve removing existing vegetation from the project site (i.e., trail footprint and construction zone), excavation and contouring to establish the trail bed, excavation for retaining wall footings and bridge abutments, construction of temporary stream crossings, and temporary stockpiling of soil. These activities would temporarily expose soil to wind and water erosion. An estimated 15.51 acres would be temporarily disturbed by construction activities and 10.86 acres would be permanently impacted by trail development. Soils in the project area generally have a high susceptibility to wind erosion. The potential for water-driven erosion is generally moderate along the trail and higher in the staging and temporary access areas. Where vegetation would be removed from sloped areas or where soils are unconsolidated in newly graded areas, surface water and wind could result in accelerated erosion. The ground disturbance created by construction of a temporary creek crossing and the use of heavy equipment traffic could result in increased erosion.

Compliance with the City's Design and Construction Standards, which prescribe erosion/sediment control and grading requirements addressing erosion, and a SWPPP to comply with the NPDES General Permit administered by the State Water Resources Control Board would be required. The SWPPP would identify structural and nonstructural BMPs to control erosion.

Temporary soils stabilization BMPs may include: scheduling limitations during the rainy season; preservation of existing vegetation; application of hydraulic mulch to disturbed areas outside of the stream channel; use of geotextiles, plastic coves, and erosion control mats; instillation of silt fences; and use of fiber rolls along the slope contour above the high-water level to intercept runoff (Caltrans 2003). Stream flow and soil strength would also inform the design and restoration of temporary stream crossings, which would be approved by a registered engineer. Bridge footings would be cast-in-drilled-hole pilings constructed to Caltrans' standard specifications. Special construction practices (e.g., temporary steel casing) may be necessary because of the granularity of area soils.

As indicated in Table 4.5-2, most soils in the project area are xerofluvents. The xerofluvent and xerorthent soils do not have a developed soil structure or a nutrient rich upper horizon commonly referred to as "topsoil." However, a topsoil layer is found in the Cometa, Fiddyment, and Ramona soils, and grading of these areas could result in a loss of soil productivity, which can make successful revegetation of disturbed areas difficult, leading to chronic erosion and poor soil health in these areas. Topsoil would be excavated and stored during construction operations and respread over disturbed areas after construction activities are complete. Disturbed soil areas would be revegetated through planting of native grasses, shrubs, and trees.

Use-related Impacts

As summarized in Table 4.5-5, most of the soils in the area are classified by the NRCS as posing only a slight erosion hazard when used for roads and trails. Moreover, the pathway would be paved and

adjacent areas would be revegetated. Because the soils on the project site are suitable for trail use and the trail would be paved, there is low potential for use of the trail to result in substantial soil erosion.

Table 4.5-5 Proposed Alignment Erosion Hazard (Road/Trail)

	Erosion Hazard			Total (acres)
	Slight	Moderate	Not Rated	
Preferred Alignment	23.27	2.15	0.95	26.37
Permanent Impact	9.97	0.70	0.19	10.86
Temporary Impact	13.30	1.45	0.76	15.51

Source: NRCS 2015

As discussed in Chapter 3, "Project Description," of this Draft EIR, a geomorphic report was prepared to provide an assessment of the potential future risk to the proposed trail because of erosion associated with the expected future water flows and trajectories of Cirby and Linda Creeks. Most of the Proposed Alignment would be located adjacent to areas with moderate to high bank erosion severity (Table 4.5-6). The report identified six locations along the preferred alignment where there would be extreme or high risk to the trail due to soil conditions and the future water flows and trajectories of the creeks (City of Roseville and Psomas 2014). The recommendations of that report (including trail realignment, bank protection, and channel modifications) in these extreme and high-risk areas have been incorporated into the project design, except where existing constraints required alternative solutions. The areas of moderate risk are generally either near the creek or have existing soil erosion, but are not likely to present a substantial hazard to the use or integrity of the trail and, as such, did not require design modification. Through the design review process established in the City's Design and Construction Standards, the City Engineer would verify that the project has been designed to avoid contributing to soil instability.

Table 4.5-6 Proposed Alignment Bank Erosion Severity

	Bank Erosion Severity				Total (feet)
	Minor	Moderate	Moderate-High	High	
Preferred Alignment	43.08	185.47	159.38	131.12	519.05
Permanent Impact	39.38	-	69.48	34.29	143.15
Temporary Impact	3.70	185.47	89.90	96.83	37.59

Source: City of Roseville and PSOMAS 2014

After construction, disturbed areas of the site would be seeded and mulched to reestablish a vegetation cover in the upland portions of the project site that would resist erosion and increase bank stability by increasing tensile strength in the soil and increasing infiltration (Caltrans 2003).

Conclusion

Although construction would expose erosion-prone soils to the effects of wind and water, the project would implement the City's standards and BMPs identified in the SWPPP. Because the portion of the project site that would be traveled by bicyclists and pedestrians would be paved, open areas would be revegetated, and streambanks would be engineered to remediate existing erosion and prevent ongoing erosion. Therefore, the Dry Creek Greenway East Trail project would have a **less-than-significant** impact on soil erosion.

Alignment Option 1A
Option 1A would reduce the area of temporary and permanent impacts by 0.40 acre and 0.29 acre, respectively. There would be a corresponding 0.72-acre reduction in the area mapped as slight erosion hazard when used for roads and trail, and a 0.03 acre increase in area not rated. There would be no change in the bank erosion severity along the alignment. Because construction activities under Option 1A would be of the same type and magnitude as would occur under the Proposed Trail Alignment, implementation of this alignment would not substantially change the potential for the project to result in soil erosion or the loss of topsoil. The impact would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 1C
Option 1C would decrease temporary impacts by approximately 0.57 acre, while increasing permanent impacts by 0.59 acre. This would result in a net increase of 0.02 acre mapped as slight erosion hazard when used for trails and roads. There would also be an increase in the length of bank affected; an additional 146.29 linear feet of moderately eroded bank would be affected (67.98 feet of temporary impacts and 78.31 acres of permanent impacts).

With implementation of Alignment Option 1C, the trail would be located in an additional area of high risk, as identified in the trail risk assessment (PSOMAS 2014). The section of trail along the east side of Dry Creek downstream of the Darling Way Bridge would be located in proximity to the eroding creek bank in an area where the stream power is high. Key constraints in this area include the distance between the top of the creek bank and the existing fence line of the adjacent private properties, an existing sewer trunk line, and a number of large trees. A reinforced concrete retaining wall would be constructed along the property line, and the trail would be located up against the property line to maximize setback from the creek. Trail width would be reduced to 8 feet, and a post and cable fence would be constructed on the western side of the trail.

Other construction activities under Option 1C would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment. Implementation of this option would not substantially change the potential for the project to result in soil erosion or the loss of topsoil. The impact would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 5A
Option 5A would increase temporary and permanent impacts by 0.13 acre and 0.22 acre, respectively. There would be a corresponding increase of 0.43 acre mapped as slight erosion hazard for roads and trails and a decrease of 0.07 acre not rated. Areas with moderate erosion hazard would be slightly less affected during construction (a reduction of 0.03 acre), but would make up slightly more of the project footprint (an increase of 0.02 acre). There would be no change in the bank erosion severity along the alignment. Because construction activities under Alignment Option 5A would be the same type as would occur under the Proposed Trail Alignment, implementation of this option would not substantially change the potential for the project to result in soil erosion or the loss of topsoil. The impact would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Mitigation Measures

None required.

Impact 4.5-3	Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.
Applicable Policies and Regulations	City of Roseville Design and Construction Standards
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 project site is not located in an area of underlying geologic instability. Localized surficial, slope failures could occur within the project site, however, primarily associated with incised and over steepened streambanks. As described above, the City's Design and Construction Standards require soil testing to inform bike path design. Where borings identify loose, sandy soils that have the potential to be subject to liquefaction, standard design practices for foundations and pilings would be incorporated to avoid potential effects on the proposed trail. For example, the standards include specifications regarding the thickness of aggregate base placed under the asphalt concrete based on the ability of soil samples to resist spreading because of an applied vertical load (the R-Value) where vehicles would use the path for maintenance or emergency access.

Raveling or caving is expected during drilling of bridge foundations because of the presence of granular material. Bridge footings would be cast-in-drilled-hole pilings constructed to Caltrans' standard specifications. Tie back walls would be used for excavation support where cuts are required next to existing bridge abutments or in steep terrain that has existing buildings in close proximity to the trail. Caltrans standard performance specifications for tieback systems would be used to attain the required design capacity.

Construction Impacts

Construction of the project would require excavation in an area with steep banks and loose, granular soils. As discussed above, construction specifications would be developed for the project based on detailed soil testing. Special construction practices (e.g., temporary steel casing) may be necessary during construction of bridge footings because of the granularity of area soils. In addition, to avoid failure of shoring walls, excessive settlement in the surrounding areas, and unsafe working conditions, controlled dewatering would be performed (when necessary) to prevent possible piping or blowout at the base of excavations. These construction practices would be consistent with the City's Design and Construction Standards.

Use-related Impacts

As discussed above, a geomorphic assessment of the potential future risk to the proposed trail developed solutions to address the potential for the trail to be located on unstable soils or soils that would become unstable as a result of the project. Through the design review process established in the City's Design and Construction Standards, the City Engineer would verify that the project has been designed to avoid contributing to a condition of soil instability.

Conclusion

With the adoption of construction practices and design features that are consistent with the City's Design and Construction Standards, the potential effects of localized, surficial ground failure would be **less than significant**.

Alignment Option 1A
Construction activities under Alignment Option 1A would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment and would generally occur in the same types of soil as the Proposed Trail Alignment in this area. The impacts would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 1C
Construction activities under Alignment Option 1C would be generally the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment and would generally occur in the same types of soil as the Proposed Trail Alignment in this area. Because trail design would reduce the hazard to the trail associated with unstable soils, the impacts would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 5A
Construction activities under Alignment Option 5A would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment and would generally occur in the same types of soil as the Proposed Trail Alignment in this area. The impacts would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Mitigation Measures

None required.

Impact 4.5-4	Be located on expansive soil, creating a substantial risk to life or property.
Applicable Policies and Regulations	City of Roseville Design and Construction Standards
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 trail would be located in an area with moderately expansive soils. Repeated shrinking and swelling of soils could cause damage to the integrity of the trail surface (such as pavement cracking) and to bridge footings. However, grading activities and placement of base materials can effectively reduce or eliminate this potential, as discussed below.

Construction Impacts
Although soils in the project area are moderately expansive, they would not cause a potential for risks to life and property during construction, because the type of damage caused by expansive soils is incremental and generally associated with the built environment.

Use-related Impacts
Soil sampling would be conducted as part of the project, as required by the City's Design and Construction Standards. The potential effect of expansive soils on the trail and bridges would be addressed through this process, and specific design features, such as specialized bridge footings or abutments, would be incorporated into the design and specifications for the project, as appropriate, to avoid or minimize the extent of potential damage. A substantial risk to life or property would not occur.

Conclusion
The impact of locating the project on moderately expansive soils would be **less than significant**.

Alignment Option 1A
Construction activities under Alignment Option 1A would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment and would generally occur in the same types of soil as the Proposed Trail Alignment in this area, although there would be one fewer bridge required with implementation of this option. The impacts would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 1C
Construction activities under Alignment Option 1C would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment and would generally occur in the same types of soil as the Proposed Trail Alignment in this area, although Option 1C would not require the widening of the Darling Way bridge. The impacts would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 5A
Construction activities under Alignment Option 5A would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment and would generally occur in the same types of soil as the Proposed Trail Alignment in this area. Implementing Option 5A would change the location of one bridge (#14 rather than #13), but would not change the number of bridges proposed. The impacts would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Mitigation Measures
None required.

Impact 4.5-5	Destroy a unique paleontological resource.
Applicable Policies and Regulations	California Public Resources Code Section 5097.5
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
The project site is primarily underlain by alluvial deposits classified in the Modesto Formation and Turlock Lake Formation along Cirby and Linda Creeks. Samples indicate that subsurface soils are generally loose, granular (i.e., sandy or silty) materials within 10 to 20 feet of the surface that increase in density with depth. A search of the University of California Museum of Paleontology's (UCMP) database was conducted on June 19, 2015. The database listed 63 paleontological resources in Placer County, however all resources are located approximately 30 miles northeast of the City of Roseville, in Tahoe National Forest. The database did not list any paleontological resources from the Turlock Lake or Modesto formation (UCMP 2015).

Although no paleontological resources have been recorded near the project site, the soils along Cirby and Linda Creeks are classified as Pleistocene-age (i.e., from about 2,588,000 to 11,700 years ago) alluvial deposits. Pleistocene sedimentary deposits are considered to have a high paleontological sensitivity, while alluvial deposits are generally considered to have low paleontological sensitivity. These alluvial deposits contain vertebrate and invertebrate remains of extant, modern taxa, which are generally not considered paleontologically significant.

Use-related Impacts

The project is a multi-use bike trail and use of the project would not include grading, excavation, or other earth-moving activities that could affect the integrity of a paleontological site.

Conclusion

Because the types of soil formations that underlay the project site have a low sensitivity for important paleontological resources, the development of the proposed project would have a **less-than-significant** impact on paleontological resources.

Alignment Option 1A

Construction activities under Alignment Option 1A would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment. Alignment Option 1A would begin north of Darling Way and would travel on the west side of Dry Creek. At the confluence of Dry Creek and Cirby Creek, this option would cross to the south side of Dry Creek and travel along the south side of Cirby Creek as the trail heads upstream.

As discussed above under the Proposed Trail Alignment, there are no known paleontological sites of any kind near the project site. Because the types of soil formations that underlay the project site are not sensitive for paleontological resources, the development of Alignment Option 1A would have a **less-than-significant** impact on paleontological resources.

Alignment Option 1C

Construction activities under Alignment Option 1C would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment. Alignment Option 1C would begin north of Darling Way and would travel on the east side of Dry Creek before crossing to the south side of Cirby Creek upstream of the confluence with Cirby Creek.

As discussed above under the Proposed Trail Alignment, there are no known paleontological sites of any kind near the project site. Because the types of soil formations that underlay the project site are not sensitive for important paleontological resources, the development of Alignment Option 1A would have a **less-than-significant** impact on paleontological resources.

Alignment Option 5A

Construction activities under Alignment Option 5A would be the same type and magnitude of physical activities and ground disturbance that would occur under the Proposed Trail Alignment. East of Eastwood Park, Alignment Option 5A would remain on the south side of Linda Creek until east of Sunrise Avenue before crossing to the north side of the creek.

As discussed above under the Proposed Trail Alignment, there are no known paleontological sites of any kind near the project site. Because the types of soil formations that underlay the project site are not sensitive for important paleontological resources, the development of Alignment Option 1A would have a **less-than-significant** impact on paleontological resources.

Mitigation Measure

None required.

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4.6 GREENHOUSE GAS EMISSIONS AND CLIMATE CHANGE

4.6.1 Introduction

This chapter presents a brief summary of the current state of climate change science and greenhouse gas (GHG) emissions sources in California; a summary of applicable regulations; and quantification of project-generated GHG emissions and discussion about their potential contribution to global climate change.

The comment letter received from the Placer County Air Pollution Control District (PCAPCD) in response to the Notice of Preparation mentions that determination of significance and mitigation of GHG emissions should be addressed, using the PCAPCD CEQA Handbook. This letter was dated December 19, 2013. In October 2016, PCAPCD released an updated Handbook which was subsequently approved by the PCAPCD Board in August 2017. The analysis contained in this section addresses this comment.

4.6.2 Environmental Setting

GHG EMISSIONS AND CLIMATE CHANGE

The Physical Scientific Basis

Certain gases in the earth's atmosphere, classified as GHG emissions, play a critical role in determining the earth's surface temperature. Solar radiation enters the earth's atmosphere from space. A portion of the radiation is absorbed by the earth's surface and a smaller portion of this radiation is reflected back toward space. This absorbed radiation is then emitted from the earth as low-frequency infrared radiation. The frequencies at which bodies emit radiation are proportional to temperature. The earth has a much lower temperature than the sun; therefore, the earth emits lower frequency radiation. Most solar radiation passes through GHGs; however, infrared radiation is absorbed by these gases. As a result, radiation that otherwise would have escaped back into space is instead "trapped," resulting in a warming of the atmosphere. This phenomenon, known as the greenhouse effect, is responsible for maintaining a habitable climate on Earth.

Prominent GHGs contributing to the greenhouse effect are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). Human-caused emissions of these GHGs in excess of natural ambient concentrations are believed responsible for intensifying the greenhouse effect and leading to a trend of unnatural warming of the earth's climate, known as global climate change or global warming. It is "extremely likely" that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by the anthropogenic increase in GHG concentrations and other anthropogenic forcings together (Intergovernmental Panel on Climate Change [IPCC] 2014:3, 5).

Climate change is a global problem. GHGs are global pollutants, unlike criteria air pollutants and toxic air contaminants, which are pollutants of regional and local concern. Whereas pollutants with localized air quality effects have relatively short atmospheric lifetimes (about one day), GHGs have long atmospheric lifetimes (one to several thousand years). GHGs persist in the atmosphere for long enough time periods to be dispersed around the globe. Although the exact lifetime of any particular GHG molecule is dependent on multiple variables and cannot be pinpointed, it is understood that more CO_2 is emitted into the atmosphere than is sequestered by ocean uptake, vegetation, and other forms of sequestration. CO_2 sinks, or reservoirs, include vegetation and the ocean, which absorb CO_2 through

sequestration and dissolution, respectively, two of the most common processes of CO_2 sequestration. Of the total annual human-caused CO_2 emissions, approximately 55 percent is sequestered through ocean and land uptakes every year, averaged over the last 50 years, whereas the remaining 45 percent of human-caused CO_2 emissions remains stored in the atmosphere (IPCC 2013:467).

The quantity of GHGs that it takes to ultimately result in climate change is not precisely known; suffice it to say, the quantity is enormous, and no single project alone would measurably contribute to a noticeable incremental change in the global average temperature, or to global, local, or micro climates. From the standpoint of CEQA, GHG impacts to global climate change are inherently cumulative.

Greenhouse Gas Emission Sources

Emissions of GHGs contributing to global climate change are attributable in large part to human activities associated with the transportation, industrial/manufacturing, utility, residential, commercial, and agricultural emissions sectors (California Air Resources Board [CARB] 2014a). In California, the transportation sector is the largest emitter of GHGs, followed by electricity generation (CARB 2014a). Emissions of CO_2 are, largely, byproducts of fossil fuel combustion. CH_4, a highly potent GHG, primarily results from off-gassing (the release of chemicals from nonmetallic substances under ambient or greater pressure conditions) and is largely associated with agricultural practices and landfills. N_2O is also largely attributable to agricultural practices and soil management. Additionally, high-global warming potential (GWP) gases have atmospheric insulative properties that are hundred to tens of thousands of times greater than that of CO_2. HFCs, PFCs, and SF_6 are some of the most common types of high-GWP gases and result from a variety of industrial processes. HFCs and PFCs are used as refrigerants and can be emitted through evaporation and leakage. SF_6 is a powerful electrical insulator used in power transmission and semiconductor manufacturing and is emitted through evaporation and leakage into the atmosphere.

EFFECTS OF CLIMATE CHANGE ON THE ENVIRONMENT

IPCC was established in 1988 by the World Meteorological Organization and the United Nations Environment Programme to provide the world with a scientific view on climate change and its potential effects. According to the IPCC global average temperature is expected to increase relative to the 1986-2005 period by 0.3–4.8 degrees Celsius (°C) (0.5-8.6 degrees Fahrenheit [°F]) by the end of the 21st century (2081-2100), depending on future GHG emission scenarios (IPCC 2014: SPM-8). This temperature range represents the lower and higher bounds of five mitigation scenarios analyzed by the IPCC – two stringent scenarios, two intermediate scenarios, and a worst-case scenario. Temperatures in California are projected to increase 2.7°F above 2000 averages by 2050 and, depending on global emission levels, 4.1–8.6°F by 2100 (Moser et al. 2012:2).

Physical conditions beyond average temperatures could be indirectly affected by the accumulation of GHG emissions. For example, changes in weather patterns resulting from increases in global average temperature are expected to result in a decreased volume of precipitation falling as snow in California and an overall reduction in snowpack in the Sierra Nevada. Based upon historical data and modeling, California Department of Water Resources (DWR) projects that the Sierra snowpack will experience a 25 to 40 percent reduction from its historic average by 2050 (DWR 2008:4). An increase in precipitation falling as rain rather than snow also could lead to increased potential for floods because water that would normally be held in the Sierra Nevada until spring could flow into the Central Valley concurrently with winter storm events (Moser et al. 2012:5). This scenario would place more pressure on California's levee/flood control system.

Another outcome of global climate change is sea level rise. Sea level rose approximately 7 inches during the last century. The National Research Council (NRC), in their 2012 report on *Sea-Level Rise for the Coasts of California, Oregon, and Washington* projects that the sea level along the California coastline will change between -1 inch (fall) to 24 inches (rise) between 2000 and 2050 and 4 to 66 inches (rise)

between 2000 and the end of this century. This projection is based on projected future ice loss at the poles, steric and ocean dynamics, seismic trends affecting land subsidence, and other numerical models and extrapolations, accounting for increasing levels of uncertainty in future years (NRC 2012:6).

As the existing climate throughout California changes over time, the ranges of various plant and wildlife species could shift or be reduced, depending on the favored temperature and moisture regimes of each species. In the worst cases, some species would become extinct or be extirpated from the state if suitable conditions are no longer available (Moser et al. 2012:11, 12).

Changes in precipitation patterns and increased temperatures are expected to alter the distribution and character of natural vegetation and associated moisture content of plants and soils. An increase in frequency of extreme heat events and drought are also expected. These changes are expected to lead to increased frequency and intensity of large wildfires (Moser et al. 2012:11).

4.6.3 Regulatory Setting

Greenhouse gas emissions and responses to global climate change are 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

Supreme Court Ruling of Carbon Dioxide as a Pollutant

The U.S. Environmental Protection Agency (EPA) is the federal agency responsible for implementing the federal Clean Air Act (CAA) and its amendments. The Supreme Court of the United States ruled on April 2, 2007 that CO_2 is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs. The ruling in this case resulted in EPA taking steps to regulate GHG emissions and lent support for state and local agencies' efforts to reduce GHG emissions.

Regulations for Greenhouse Gas Emissions from Passenger Cars and Trucks and Corporate Average Fuel Economy Standards

In October 2012, EPA and the National Highway Traffic Safety Administration (NHSTA), on behalf of the Department of Transportation, issued final rules to further reduce GHG emissions and improve corporate average fuel economy (CAFE) standards for light-duty vehicles for model years 2017 and beyond (77 FR 62624). NHTSA's CAFE standards have been enacted under the Energy Policy and Conservation Act since 1978. This national program requires automobile manufacturers to build a single light-duty national fleet that meets all requirements under both federal programs and the standards of California and other states. This program would increase fuel economy to the equivalent of 54.5 miles per gallon (mpg) limiting vehicle emissions to 163 grams of CO_2 per mile for the fleet of cars and light-duty trucks by model year 2025 (77 FR 62630).

In January 2017, EPA Administrator Gina McCarthy signed her determination to maintain the current GHG emissions standards for model year 2022-2025 vehicles. However, on March 15, 2017, the new EPA Administrator, Scott Pruitt, and Department of Transportation Secretary Elaine Chao announced that EPA intends to reconsider the final determination. EPA intends to make a new Final Determination regarding the appropriateness of the standards no later than April 1, 2018 (EPA 2017).

STATE

Executive Order S-3-05

Executive Order (EO) S-3-05, signed by Governor Arnold Schwarzenegger in 2005, proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra Nevada snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the executive order established total GHG emission targets for the state. Specifically, statewide emissions are to be reduced to 2000 levels by 2010, 1990 levels by 2020, and to 80 percent below 1990 levels by 2050.

This executive order was the subject of a California Appellate Court decision, *Cleveland National Forest Foundation v. San Diego Association of Governments* (SANDAG) (November 24, 2014) 231 Cal.App.4th 1056, which was reviewed by the California Supreme Court in January 2017. The Supreme Court decided a singular question in the case, which was released on July 13, 2017. The California Supreme Court ruled that SANDAG did not abuse its discretion by declining "to adopt the 2050 goal as a measure of significance in light of the fact that the Executive Order does not specify any plan or implementation measures to achieve its goal."

In addition to concluding that an EIR need not use this executive order's goal for determining significance, the Court described several principles relevant to CEQA review of GHG impacts, including: (1) EIRs should "reasonably evaluate" the "long-range GHG emission impacts for the year 2050;" (2) the 2050 target is "grounded in sound science" in that it is "based on the scientifically supported level of emissions reduction needed to avoid significant disruption of the climate;" (3) in the case of the SANDAG plan, the increase in long-range GHG emissions by 2050, which would be substantially greater than 2010 levels, was appropriately determined to be significant and unavoidable; (4) the reasoning that a project's role in achieving a long-range emission reduction target is "likely small" is not valid for rejecting a target; and (5) "as more and better data become available," analysis of proposed plan impacts will likely improve, such that "CEQA analysis stays in step with evolving scientific knowledge and state regulatory schemes." The Court also ruled that "an EIR's designation of a particular adverse environmental effect as 'significant' does not excuse the EIR's failure to reasonably describe the nature and magnitude of the adverse effect." The Court also recognized that the 40 percent reduction in 1990 GHG levels by 2030 is "widely acknowledged" as a "necessary interim target to ensure that California meets its longer-range goal of reducing greenhouse gas emission 80 percent below 1990 levels by the year 2050." Senate Bill (SB) 32 has since defined the 2030 goal in statute (discussed below).

Executive Order B-30-15

On April 20, 2015 Governor Brown signed EO B-30-15 to establish a California GHG reduction target of 40 percent below 1990 levels by 2030. The Governor's EO aligns California's GHG reduction targets with those of leading international governments such as the 28-nation European Union, which adopted the same target in October 2014. California is on track to meet or exceed the target of reducing GHG emissions to 1990 levels by 2020, as established in the California Global Warming Solutions Act of 2006 (Assembly Bill 32, discussed above). California's new emission reduction target of 40 percent below 1990 levels by 2030 sets the next interim step in the State's continuing efforts to pursue the long-term target expressed under Executive Order S-3-05 to reach the ultimate goal of reducing emissions 80 percent below 1990 levels by 2050. This is in line with the scientifically established levels needed in the U.S. to limit global warming below 2°C, the warming threshold at which major climate disruptions are projected, such as super droughts and rising sea levels.

Assembly Bill 32, the California Global Warming Solutions Act of 2006

In September 2006, Governor Schwarzenegger signed the California Global Warming Solutions Act of 2006 (Assembly Bill [AB] 32). AB 32 establishes regulatory, reporting, and market mechanisms to achieve quantifiable reductions in GHG emissions and a cap on statewide GHG emissions. AB 32

requires that statewide GHG emissions be reduced to 1990 levels by 2020. AB 32 also requires that these reductions "…shall remain in effect unless otherwise amended or repealed. (b) It is the intent of the Legislature that the statewide greenhouse gas emissions limit continue in existence and be used to maintain and continue reductions in emissions of greenhouse gases beyond 2020. (c) The (Air Resources Board) shall make recommendations to the Governor and the Legislature on how to continue reductions of greenhouse gas emissions beyond 2020" (California Health and Safety Code, Division 25.5, Part 3, Section 38551).

Assembly Bill 32 Climate Change Scoping Plan and Update

In December 2008, CARB adopted its Climate Change Scoping Plan, which contains the main strategies California will implement to achieve reduction of approximately 118 million metric tons (MMT) of CO_2-equivalent (CO_2e) emissions, or approximately 21.7 percent from the state's projected 2020 emission level of 545 MMT CO_2e under a business-as-usual scenario (this is a reduction of 47 MMT CO_2e, or almost 10 percent, from 2008 emissions).

In 2014, CARB adopted the *First Update to the Climate Change Scoping Plan* to identify the next steps in reaching AB 32 goals and evaluate the progress that has been made between 2000 and 2012 (CARB 2014b:4 and 5). According to the update, California is on track to meet the near-term 2020 GHG limit and is well positioned to maintain and continue reductions beyond 2020 (CARB 2014b:ES-2). The update also reports the trends in GHG emissions from various emission sectors (e.g., transportation, building energy, agriculture). After releasing multiple versions of proposed updates in 2017 CARB adopted the next version titled *California's 2017 Climate Change Scoping Plan* (2017 Scoping Plan) in December of that same year (CARB 2017). The 2017 Scoping Plan indicates that California is on track to achieve the 2020 statewide GHG target mandated by AB 32 of 2006 (CARB 2017:9). It also lays out the framework for achieving the mandate of SB 32 of 2016 to reduce statewide GHG emissions to at least 40 percent below 1990 levels by the end of 2030 (CARB 2017).

The update also identifies how GHGs associated with proposed projects could be evaluated under CEQA. Specifically, it states that achieving "no net increase" in GHG emissions is an appropriate overall objective of projects evaluated under CEQA if conformity with an applicable local GHG reduction plan cannot be demonstrated. CARB recognizes that it may not be appropriate or feasible for every development project to mitigate its GHG emissions to zero and that an increase in GHG emissions attributable to a project may not necessarily imply a substantial contribution to the cumulatively significant environmental impact of climate change. In terms of current project-level thresholds, the Placer County Air Pollution Control District (PCAPCD) has developed an evidenced-based, bright-line numeric threshold consistent with the state's long-term 2030 GHG goal.

Senate Bill 32/Assembly Bill 197 (Statutes of 2016)

In August 2016, Governor Brown signed SB 32 and AB 197, which serve to extend California's GHG reduction programs beyond 2020. SB 32 amended the Health and Safety Code to include Section 38566, which contains language to authorize CARB to achieve a statewide GHG emission reduction of at least 40 percent below 1990 levels by no later than December 31, 2030. SB 32 codified the targets established by EO B-30-15 for 2030.

Senate Bill 375 (Statutes of 2008)

SB 375, signed by the Governor in September 2008, aligns regional transportation planning efforts, regional GHG emission reduction targets for cars and light duty trucks, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy, showing prescribed land use allocation in each MPO's Regional Transportation Plan. CARB, in consultation with the MPOs, is to provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in their respective regions for 2020 and 2035.

The applicable MPO in the project region is the Sacramento Area Council of Governments (SACOG), which includes Placer County except for of the Lake Tahoe Basin. SACOG adopted its first SCS in 2012, which was subsequently updated and adopted in 2016 (SACOG 2016). SACOG was tasked by CARB to achieve a 9 percent per capita reduction by 2020 and a 16 percent per capita reduction by 2035, which CARB confirmed the region would achieve by implementing its SCS (CARB 2013).

Advanced Clean Cars Program

In January 2012, CARB approved the Advanced Clean Cars program which combines the control of GHG emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of regulatory standards for vehicle model years 2017 through 2025. The new regulations strengthen the GHG standard for 2017 models and beyond. This will be achieved through existing technologies, the use of stronger and lighter materials, and more efficient drivetrains and engines. The program's zero-emission vehicle regulation requires battery, fuel cell, and/or plug-in hybrid electric vehicles to account for up to 15 percent of California's new vehicle sales by 2025. The program also includes a clean fuels outlet regulation designed to support the commercialization of zero-emission hydrogen fuel cell vehicles planned by vehicle manufacturers by 2015 by requiring increased numbers of hydrogen fueling stations throughout the state. The number of stations will grow as vehicle manufacturers sell more fuel cell vehicles. By 2025, when the rules will be fully implemented, the statewide fleet of new cars and light trucks will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions than the statewide fleet in 2016 (CARB 2016).

Senate Bill 97

The Senate Bill 97 (Statutes of 2007) (SB 97) directed the California Natural Resources Agency to adopt amendments to the CEQA Guidelines to specifically address GHG emissions. The Amendments became effective on March 18, 2010. This EIR complies with these Amendments and the CEQA checklist questions added to Appendix G of the CEQA Guidelines in response to SB 97 are discussed under the Significance Criteria heading below.

LOCAL

Placer County Air Pollution Control District

In October 2016, PCAPCD adopted new significance thresholds for GHG emissions in October 2016. These thresholds are included PCAPCD's updated 2017 CEQA Air Quality Handbook (August, 2017). The District's CEQA Air Quality Handbook outlines expectations and methodologies for the analysis of GHG emissions generated by a proposed project, and guidance on determining the significance of impacts and appropriate mitigation. PCAPCD recommends that both construction and operations-related GHG emissions be quantified for a proposed project, and that the significance of GHG emissions be determined in a manner based on whether such emissions are cumulatively considerable.

City of Roseville General Plan 2035

The City of Roseville General Plan 2035 contains a number of goals and policies applicable to the proposed project that address air quality and climate change. Key provisions from the Air Quality and Climate Change Element are summarized below. Numerous other General Plan elements also address sustainability and the reduction of GHG emissions, including the Circulation Element, Land Use Element, and Public Facilities Element.

Air Quality and Climate Change Element Goals

GOAL 3: Encourage the coordination and integration of all forms of public transport while reducing motor vehicle emissions through a decrease in the average daily trips and vehicle miles traveled and by increasing the commute vehicle occupancy rate by 50 percent to 1.5 or more persons per vehicle.

GOAL 4: Increase the capacity of the transportation system, including the roadway system and alternate modes of transportation.

GOAL 5: Provide adequate pedestrian and bikeway facilities for present and future transportation needs.

GOAL 7: While recognizing that the automobile is the primary form of transportation, the City of Roseville should make a commitment to shift from the automobile to other modes of transportation.

Air Quality and Climate Change Element Transportation and Circulation-Related Policies

- **Policy 6.** Develop consistent and accurate procedures for mitigating transportation emissions from new and existing projects.
- **Policy 7.** Encourage alternative modes of transportation including pedestrian, bicycle, and transit usage.
- **Policy 10.** Conserve energy and reduce air emissions by encouraging energy efficient building designs and transportation systems.

Air Quality and Climate Change Element Implementation Measures

6. Mitigation Strategies – Motor Vehicles

- Develop mitigation strategies to reduce air emissions from motor vehicles. These strategies, which may consist of improvements and refinements to the transportation and circulation infrastructure, may include:
  - Maintaining acceptable levels of service as specified in the Circulation Element;
  - Minimizing the number of intersections along major arterials;
  - Requiring traffic counter loops and traffic management hardware at major garage entrances, driveways, new intersections, and other appropriate locations;
  - Synchronizing traffic signals on arterial streets to the extent possible to facilitate the flow of traffic and minimize stops or delays;
  - Considering high occupancy vehicle lanes in street and highway widening and new construction projects for arterials and wider rights-of-way; and
  - Filling gaps or missing links in infrastructure systems (i.e., bike/pedestrian trails, bridge crossings, railroad crossings, street extensions) prior to the construction and occupancy of residential developments utilizing that infrastructure.

- Develop strategies to minimize the number and length of vehicle trips, which may include:
  - Promoting commercial/industrial project proponent sponsorship of van pools or club buses;
  - Encouraging commercial/industrial project day care and employee services at the employment site;
  - Encouraging the provision of transit, especially for employment-intensive uses of 200 or more employees;
  - Providing subscription bus service to major trip generators or events;
  - Discouraging single-occupant vehicle trips through parking supply and pricing controls or other measures identified by the PCAPCD;
  - Providing incentives for the use of transportation alternatives;
  - Providing expansion and improvement of public transportation services and facilities;
  - Encouraging public transit use and the formation of car pools in new areas by requiring bus turnouts, bus shelters, and/or park-and-ride lots;
  - Locating public facilities in areas easily served by public transportation; and

- Requiring that large developments (e.g. Specific plans, large commercial or residential uses) dedicate land for use as park-and-ride lots if suitably located, or requiring large developments to provide park-and-ride spaces if located adjacent to regional transit facilities.

7. Mitigation Strategies – Motor Vehicle Alternatives

- Encourage transportation alternatives to motor vehicles by developing infrastructure amenable to such alternatives by doing the following:
  - Implement the Bicycle Master Plan and Long-Range Transit Plan as specified in the Circulation Element;
  - Consider right-of-way requirements for bike usage in the planning of new arterial and collector streets and in street improvement projects;
  - Require that new development be designed to promote pedestrian and bicycle access and circulation;
  - Provide safe and secure bicycle parking facilities at major activity centers, such as public facilities, employment sites, and shopping and office centers;
  - Provide convenient and safe pedestrian and bike movement through the large parking areas that surround large retail and office centers;
  - Provide safe pathways that link residential areas to schools, parks, services, and employment areas and transit facilities;
  - Promote project design that encourages pedestrian and cyclist use, including grade separated crossing at major arterials, clear and safe connections between projects and uses;
  - Install sidewalks in residential and commercial developments with protective curbing and adequate lighting and pedestrian amenities.

City of Roseville Communitywide Sustainability Action Plan

The Roseville Communitywide Sustainability Action Plan (SAP) sets forth a comprehensive strategy to reduce GHG emissions, as well as to promote economic growth based on clean technology and sustainable practices (City of Roseville 2010). While the 2035 General Plan includes goals and policies that guide the City's approach to addressing sustainability and climate change, the SAP serves as a more detailed strategy to implement the City's sustainability and climate change policies.

As noted earlier in this section, the SAP contains the City's GHG emissions baseline inventory. The SAP also sets a GHG emissions reduction target of reducing emissions from the baseline level of 7.5 MT CO_2e per service population to 6.0 MT CO_2e per service population by 2020.

The SAP contains five sustainable action strategies, with specific measures under each designed to achieve the City's goals and targets. The actions include bike and pedestrian enhancements in the Transportation Strategy. The actions are summarized below in Table 4.6-1.

The City plans to complete a qualified communitywide climate action plan by late 2018 (City of Roseville 2017).

Table 4.6-1 Roseville Sustainability Action Plan Strategies and GHG Emission Reductions

Sustainable Action Strategy	Summary of Measures	Total Estimated GHG Emission Reductions (MT CO_2e)	Percent of Total GHG Reductions Required to Meet Target
Transportation	Rideshare and Carpooling Transit Expansion Bike and Pedestrian Enhancements Alternative Fuel Infrastructure Intelligent Transportation Systems	49,130	66%
Land Use and Green Building	Urban Forestry Numerous supporting measures related to alternative transportation modes	1,580	2%
Energy	Retrofits of Existing Residential Buildings Retrofits of Existing Commercial Buildings New Residential Building Energy Efficiency New Commercial Building Energy Efficiency	19,460	26%
Solid Waste	Food Waste to Energy	1,090	1%
Water	Reduce Water Use 20% Per Capita	3,520	5%
Marketing and Education	Community-Based Social Marketing Promote sustainable lifestyles	NA	NA
Total		74,060	100%

Notes: Totals may not sum due to rounding

GHG = greenhouse gas; MT = metric tons, CO_2e = carbon dioxide equivalent. Totals may not be exact due to rounding.

Source: City of Roseville 2010; adapted and compiled by Ascent in 2017.

City of Roseville Municipal Climate Action Plan

The Roseville City Council adopted a Municipal Climate Action Plan (CAP) in 2009. The plan addressed GHG emission reductions from City facilities and operations, including buildings, vehicle fleets, treatment plants, and other infrastructure. The CAP established a baseline municipal emissions inventory of 28,858 MT CO_2e for the year 2006. The City Council approved a GHG reduction goal of 22.8 percent by 2035 through a variety of measures applicable to these sources (City of Roseville 2009). The Communitywide SAP described above is designed to complement the strategies contained in the Municipal CAP.

4.6.4 Impacts

METHODS OF ANALYSIS

Short-term construction-generated GHG emissions were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.1 computer program (South Coast Air Quality Management District 2016), as recommended by PCAPCD and other air districts in California. Modeling was based on project-specific information (e.g., size, amounts of demolition, area to be graded, area to be paved), where available; reasonable assumptions based on typical construction activities; and default values in CalEEMod that are based on the project's location.

Construction-related activities that would generate GHGs include worker commute trips, haul trucks carrying supplies and materials to and from the project site, and off-road construction equipment (e.g., dozers, loaders, excavators). Because the proposed project would be constructed in four segments,

annual construction emissions were modeled for each segment and phase separately, according to construction phasing and equipment anticipated for each segment.

The proposed project would include use of a multi-use trail by bicyclists and pedestrians and routine maintenance activities. Accordingly, no increases in motor vehicle trips and associated tailpipe emissions by users would be generated by the project, and maintenance-related emissions would be minimal. Similarly, no new buildings would be constructed or operated as part of the proposed project. Thus, calculations of operation-related GHG emissions are not needed. Operation-related GHG emissions, apart from the loss in carbon sequestration potential discussed below, are addressed qualitatively in the impact analysis.

The project also would involve the net removal of up to 0.7 acre of riparian forest and up to 4.3 acres of valley oak riparian woodland over the course of the project's four-year construction period. The net carbon sequestration losses from the net reduction in vegetation was estimated using CalEEMod's sequestration module. CalEEMod uses a separate set of land use types and units to estimate emissions from loss of stored carbon than to estimate emissions from lost sequestration potential. To estimate emissions from the loss of stored carbon, CalEEMod bases the calculation of a set of land use types (e.g., scrub, trees, cropland, grassland, wetland) and uses per-acre emissions factors. To estimate emissions from the loss of sequestration potential, CalEEMod bases the calculation on a set of tree types either lost or planted (e.g., mixed hardwood, juniper, cedar/larch, miscellaneous) and uses annual per-tree emission factors. Due to the variety of tree species that inhabit the project area, the "trees" land use category and the "miscellaneous" tree category in CalEEMod are assumed to best reflect both riparian forest and valley oak riparian woodland. CalEEMod assumes the "tree" land use type would store 111 MT CO_2/acre and "miscellaneous" tree types would sequester 0.0354 MT CO_2 per tree per year. Based on a general review of the project map, there are approximately 15 trees per acre within the project boundary. See Tables 11.11 and 11.2 of Appendix D of the CalEEMod Version 2016.3.1 for a list of the carbon loss and sequestration factors.

The loss of stored carbon in the removed vegetation is conservatively assumed to be completely returned to the atmosphere as CO_2, such as through burning, and these emissions are counted toward the project's construction emissions. This is a conservative approach to avoid the risk of understating an impact; it may come to pass that not all the carbon is returned to the atmosphere, if some of the wood is repurposed, rather than burned (such as for chipping and mulch). The resulting annual loss in carbon sequestration potential is counted toward the project's operational emissions. Due to the approximate nature of the carbon sequestration factors used above, the carbon losses estimated here are assumed to apply to all vegetation types within riparian forest and valley oak riparian woodland removed by the project. Also, the loss of stored carbon over the four-year construction period is assumed to be proportional to the construction activity in each year.

THRESHOLDS OF SIGNIFICANCE

Appendix G of the State CEQA Guidelines indicates that a proposed project would result in a potentially significant impact on climate change if it would:

- generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or
- conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

In October 2016, PCAPCD adopted new CEQA thresholds of significance for evaluating whether the GHG emissions of different types of projects would be a cumulatively considerable contribution to climate change. These new thresholds are supported by PCAPCD's California Environmental Quality Act Thresholds of Significance Justification Report released in October 2016 and are included in the

PCAPCD's draft 2017 Handbook (PCAPCD 2016, 2017). PCAPCD's proposed GHG thresholds more accurately reflect the historical CEQA projects reviewed by PCAPCD over the last thirteen years (2003-2015) and the CEQA significance thresholds adopted by other air districts in the Sacramento Area (PCAPCD 2016:5). PCAPCD recommends an array of GHG thresholds for determining whether a project's GHG emissions would be cumulatively considerable. More specifically, PCAPCD's recommendations include:

- a "floor" mass emission threshold of 1,100 MT CO_2e/year, which, if not exceeded, means the project's GHGs would be less than cumulatively considerable (regardless of the project's GHG efficiency);
- a "bright-line cap" mass emission threshold of 10,000 MT CO2e/year levels, which, if exceeded, means the project's GHGs would be cumulatively considerable regardless of the project's GHG efficiency; and
- GHG efficiency-based thresholds for land use development projects, depending on whether the project is rural or urban and residential or non-residential (e.g., 4.5 MT CO_2e/year per capita and 26.5 MT CO_2e/year/1,000 square feet for residential and non-residential land uses in urban areas, respectively) (PCAPCD 2016:E-2).

With respect to construction-related emissions PCAPCD, considers a "bright-line cap" of 10,000 MT CO_2e for determining the level of significance for land use construction phases (PCAPCD 2016:22).

For this particular project, the City evaluates the net change in GHGs resulting from the project in light of the "floor" mass emission thresholds being proposed by PCAPCD. This is because per-capita and per-square footage efficiency metrics are not suitable for recreational sites that provide neither employment nor housing.

ISSUES OR POTENTIAL IMPACTS NOT DISCUSSED FURTHER

The analysis in this section focuses on both construction-related and operational GHG emissions. There are no issues or potential impacts that were considered and dismissed from further evaluation.

IMPACT ANALYSIS

Impact 4.6-1	Conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.
Applicable Policies and Regulations	Assembly Bill 32 (2006), Senate Bill 32 (2016) City of Roseville General Plan 2025, Sustainability Action Plan
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-related activities that would generate GHGs include worker commute trips, haul trucks carrying supplies and materials to and from the project site, off-road construction equipment (e.g., dozers, loaders, excavators), and loss of carbon storage and sequestration potential.

Appendix E contains model input and output parameters, detailed assumptions, and annual construction emissions estimates, expressed in MT CO_2e/year. Construction emissions are summarized in Table 4.6-2. Based on the modeling, which assumes Segments A, B, and C would be constructed together within the same years (2021 and 2022), construction of the proposed project would result in maximum annual GHG emissions of approximately 406 MT CO_2e within the first year of construction, with lesser amounts in subsequent years. The maximum annual GHG emissions during construction would be below the 10,000 MT CO_2e/year mass emissions threshold of significance for construction activities. Thus, short-term construction-generated GHG emissions would not be cumulatively considerable.

Table 4.6-2 Summary of Maximum Annual GHG Emissions Associated with Project Construction Activities[1]

	2021 GHG Emissions (MT CO_2e/year)	2022 GHG Emissions (MT CO_2e/year)	2023 GHG Emissions (MT CO_2e/year)	2024 GHG Emissions (MT CO_2e/year)
Segment A: Darling Way – Eastwood Park	279	272	-	-
Segment B: Eastwood Park – Oak Ridge Drive	101	60	-	-
Segment C: Eich School – Rocky Ridge Dr	27	73	-	-
Segment D: Rocky Ridge Dr – Spahn Ranch Rd	-	-	228	145
Total Construction Activity Emissions (MT CO_2e/yr)	406	404	228	145
Total Emissions from Lost Carbon Storage from Permanent Vegetation Removal (MT CO_2/yr)	189	188	106	67
Total Maximum Annual Emissions (MT CO_2e/yr)	**594**	**592**	**334**	**212**
PCAPCD Construction Threshold of Significance (MT CO_2e/yr)	10,000	10,000	10,000	10,000

Notes: Totals may not sum due to rounding.

GHG = greenhouse gas emissions

MT CO_2e/year = metric tons of carbon dioxide-equivalent per year

PCAPCD = Placer County Air Pollution Control District

[1] Modeled values represent maximum annual GHG emissions that could occur in each year during all phases of construction for each segment of the proposed project. See Appendix E for detail on model inputs, assumptions, and project specific modeling parameters.

Source: CalEEMod 2016.3.1.; modeling conducted by Ascent Environmental in 2017

Use-related Impacts

The proposed project would include use of a multi-use trail by pedestrians and bicyclists and occasional routine maintenance. Accordingly, no substantial increases in motor vehicle trips and associated tailpipe emissions would be generated by the use and maintenance of the project. Similarly, no new buildings would be constructed and operated as part of the proposed project. The project would include a limited number of new outdoor lighting fixtures along some portions of the trail, such as along undercrossings and underneath or on bridges; however, energy consumption and GHG emissions associated with this lighting would be minimal. Occasional future trail maintenance activities could require the use of motor vehicles or motorized equipment related to landscaping or pavement repairs; however, the scope or frequency of such activities would be minor, short-term, and infrequent in nature and would result in minimal annual GHG emissions.

Loss of carbon sequestration potential from permanent removal of vegetation would result in approximately 2.6 MT CO_2 "emitted" per year, which is below PCAPCD's "floor" emissions threshold of 1,100 MT CO_2e/year.

Use of the multi-use trail project would be consistent with adopted policies and implementation measures in the City of Roseville General Plan and SAP (see Regulatory Setting above) designed to reduce GHG emissions from mobile sources, which is the largest existing and projected future source of GHG emissions within both the City and region. Key policies and measures include:

- expanding the capacity of the system for alternate modes (General Plan, Air Quality and Climate Change Goal 4);
- providing adequate pedestrian and bikeway facilities for present and future transportation needs (General Plan, Air Quality and Climate Change Goal 5);
- encouraging alternative modes of transportation including pedestrian, bicycle, and transit usage (General Plan, Air Quality and Climate Change Policy 7);
- implementing the Bicycle Master Plan and Long-Range Transit Plan as specified in the Circulation Element (General Plan, Air Quality and Climate Change Element Implementation Measures, 7. Mitigation Strategies – Motor Vehicle Alternatives);
- providing safe pathways that link residential areas to schools, parks, services, and employment areas and transit facilities (General Plan, Air Quality and Climate Change Element Implementation Measures, 7. Mitigation Strategies – Motor Vehicle Alternatives); and
- various bike and pedestrian measures contained in the City's SAP.

While it cannot be known with certainty how many motor vehicle trips or vehicle miles traveled (VMT) could be reduced by increased use of the proposed trail by bicyclists and pedestrians (in lieu of vehicle trips), over the long term it is expected that trail use would contribute to decreased motor vehicle travel, which would help achieve operational GHG emissions reductions identified in the adopted plans and measures designed to achieve communitywide GHG emissions reductions. These reductions would likely offset or exceed any potential increases in GHG emissions associated with energy consumed by new lighting or mobile-source emissions from trail maintenance activities, because energy-efficient lighting consumes minimal electricity and maintenance would be a minor, infrequent, and short-term activity in each instance. Additionally, the loss of carbon sequestration from permanently removed vegetation would be less than 3 MT CO_2e/year. As a result, increases in GHG emissions associated use of the proposed project would not exceed the "floor" mass emissions threshold of 1,100 MT CO_2e/year.

Conclusion

Both construction-related and operational GHG emissions associated with the proposed project would not generate GHG emissions, directly or indirectly, that would have a significant effect on the environment, and the proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. It is reasonably foreseeable that a net GHG benefit could accrue over the long term to the extent that bicycle or pedestrian travel occurs on the proposed trail in lieu of motor vehicle trips. Such a benefit would be consistent with the mobility enhancement goal of the proposed project. It is not feasible to precisely quantify the number of motor vehicle trips avoided, so a beneficial impact conclusion would not be a certainty. Consequently, for CEQA compliance purposes, this impact would be noted as **less than significant**.

Alignment Option 1A

Both construction and operational activities for Option 1A would be the same type and general magnitude of activities that would occur under the Proposed Trail Alignment. The total number of bridges constructed under Option 1A would be less than the number of bridges constructed under the Proposed Trail Alignment, which would result in fewer GHG emissions associated with bridge construction activities. Option 1A would require an additional 765 linear feet of retaining walls or streambank stabilization when compared to the Proposed Trail Alignment. However, construction

emissions would be less than under the Proposed Trail Alignment, because emissions from the lighter type of equipment needed to construct these elements would be less than emissions for the heavy construction equipment needed for bridge construction. Additionally, the area of permanent vegetation removed would be less under Option 1A than the Proposed Trail Alignment. Thus, construction and operational activities under Option 1A would be less than estimated emissions for the Proposed Trail Alignment and would not exceed PCAPCD's recommended "floor" mass emissions thresholds. Therefore, project construction or use under this option would not generate GHG emissions, directly or indirectly, that would have a significant effect on the environment; and, the proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. This impact would be **less than significant**.

Alignment Option 1C

Both construction and operational activities for Option 1C would be the same type and general magnitude of activities that would occur under the Proposed Trail Alignment. Option 1C would not require the widening of the Darling Way bridge, which would result in fewer emissions associated with bridge construction activities. Construction and operational activities under Option 1C would be less than estimated emissions for the Proposed Trail Alignment. The area of permanent vegetation removed would be slightly higher than the Proposed Trail Alignment, but still below PCAPCD's "floor" emissions threshold of 1,100 MT CO_2e/year. Thus, implementation of Option 1C would not exceed PCAPCD's recommended "floor" mass emissions thresholds. Therefore, project construction or use under this option would not generate GHG emissions, directly or indirectly, that would have a significant effect on the environment; and, the proposed project would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. This impact would be **less than significant**.

Alignment Option 5A

Both construction and operational activities for Option 5A would be the same type and general magnitude of activities that would occur under the Proposed Trail Alignment. Implementing Option 5A would change the location of one bridge (#14 rather than #13), but would not change the number of bridges proposed, which would result in the same emissions associated with bridge construction activities. Construction and operational activities under Option 5A would be the same as estimated emissions for the Proposed Trail Alignment. The area of permanent vegetation removed would be slightly higher than the Proposed Trail Alignment, but still below PCAPCD's "floor" emissions threshold of 1,100 MT CO_2e/year. Thus, implementation of Option 5A would not exceed PCAPCD's recommended "floor" mass emissions thresholds. Therefore, project construction or use under this option would not generate GHG emissions, directly or indirectly, that would have a significant effect on the environment; and, would not conflict with any applicable plan, policy or regulation of an agency adopted for the purpose of reducing the emissions of GHGs. This impact would be **less than significant**.

Mitigation Measures

None required.

4.7 HAZARDS AND HAZARDOUS MATERIALS

4.7.1 Introduction

This section describes existing and potential future hazards within the project area, including the potential for exposure to hazardous materials. This section is based primarily on the results of the Initial Site Assessment prepared for the project (ENGEO 2015) and a Limited Site Assessment Report (Crawford & Associates, Inc. 2016).

For purposes of this chapter, the term "hazardous materials" refers to both hazardous substances and hazardous wastes. A "hazardous material" is defined in the Code of Federal Regulations (CFR) as "a substance or material that … is capable of posing an unreasonable risk to health, safety, and property when transported in commerce" (49 CFR 171.8). California Health and Safety Code Section 25501 defines a hazardous material as: "…any material that, because of its quantity, concentration, or physical, or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment."

No comments related to hazards and hazardous materials were received during public review of the Notice of Preparation.

4.7.2 Environmental Setting

As described in Section 4.5, "Geology and Soils," the project site is generally underlain by loamy alluvial soils that are well drained. The surface creeks in the project area generally flow from east to west. Groundwater is 13 to 25 feet below the ground surface (ENGEO 2015:7).

The nearest sensitive receptors to the project site are single-family residences located on properties adjacent to the project boundary along the length of the proposed multi-use trail. There are three schools within 0.25-mile of the project site: Saint Rose School (633 Vine Avenue), George Cirby Elementary School/Head Start Preschool (814 Darling Way), and Warren T. Eich Middle School (1509 Sierra Gardens Drive). George Cirby Elementary School and Warren T. Eich Middle School are operated by the Roseville City School District. The Head Start Preschool is operated by the non-profit Placer Community Action Council. Saint Rose School is operated privately.

WILDLAND FIRE HAZARDS

The Roseville Fire Department's (RFD's) Fire Prevention Division conducts fire code enforcement, plan review services, hazardous materials enforcement, fire cause investigation, and hazard abatement activities. The Fire Prevention Division includes a program objective to reduce the fire hazard to structures caused by weeds and grass on all vacant lots within the city, and to respond to fire hazard complaints within 10 working days.

The potential for wildland fire is influenced by three factors: the presence of fuel (i.e., vegetation), the area's topography (i.e., slope and elevation), and air mass (i.e., temperature, relative humidity, wind speed and direction, cloud cover, precipitation amount and duration, and the stability of the atmosphere). The City of Roseville has identified much of the undeveloped land adjacent to the project site as areas of concern for wildland fire (Exhibit 4.7-1). Wildfire response access points have been established in these areas to help the fire department locate entrance points onto undeveloped lands in

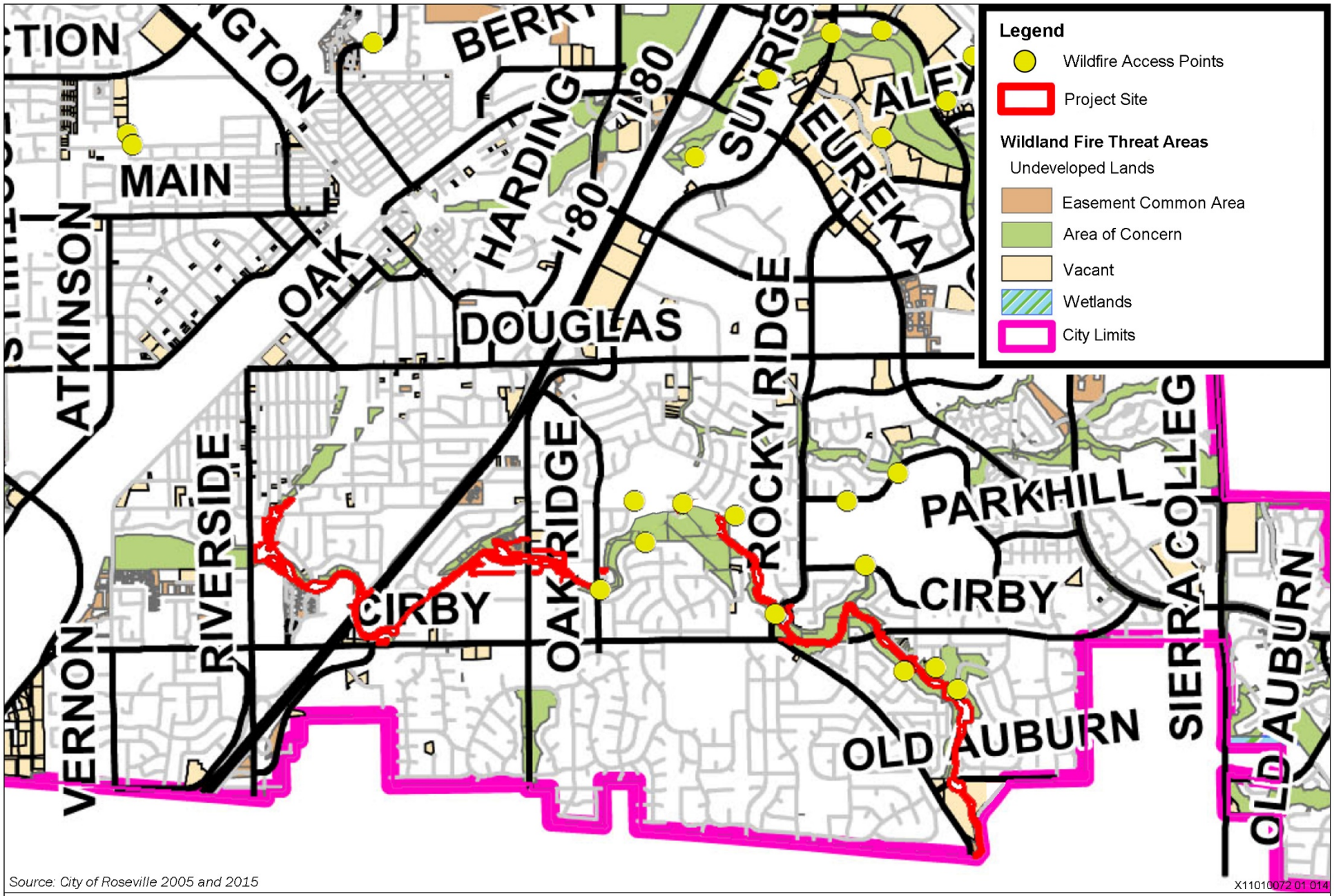

Exhibit 4.7-1

Wildland Fire Threat Areas

the event of a grass or wildland fire. Access points to the project site are located off Oak Ridge Drive, the western side of Eich Intermediate School, Sierra Gardens Drive, Meadow Lark Way, Rocky Ridge Drive, Champion Oaks Drive, Meadow Lane, and West Colonial Parkway (Exhibit 4.7-1). As a result of these planning efforts, wildland fires are typically easily accessible for firefighting apparatus and fires tend to be localized (City of Roseville 2005:14-10).

POTENTIAL SITES OF CONTAMINATION

The Initial Site Assessment (ENGEO 2015) did not identify any sites with recognized environmental conditions (i.e., sites with the presence or likely presence of any hazardous substances or petroleum products in, on, or at a property because of any release to the environment, under conditions indicative of a release to the environment, or under conditions that pose a material threat of a future release to the environment) through review of public databases. In addition, no hazardous substances, petroleum products, aboveground storage tanks, or evidence of existing underground storage tanks (USTs) were observed during the site reconnaissance conducted as part of the Initial Site Assessment (ENGEO 2015).

Active buildings on properties designated for right-of-way acquisition include: 625 Riverside Avenue (auto sales), 641 Riverside Avenue (auto sales/smog/vehicle repair), 643 Riverside Avenue (auto sales), and 645 Riverside Avenue (commercial/industrial building). The building at 645 Riverside Avenue, which is currently vacant and has cinder block walls and large roll up doors, was constructed prior to 1971. There is evidence, including an old electrical panel, that another structure was historically located on this property. A small concrete pad and two pipes were noted adjacent to the south side of the building. In addition, a depression and concrete slab were visible at the southeast corner of the building. Underground storm or sewer manholes were noted along the eastern edges of 645 and 649 Riverside Avenue, along the bank of Dry Creek. According to RFD records, an unpermitted leach pit is located east of the building at 641 Riverside Avenue (ENGEO 2015).

A site assessment consisting of soil and groundwater sampling and a geophysical survey for USTs, product distribution piping, septic systems, and wells was conducted in 2016. This assessment found very low concentrations of motor fuel hydrocarbon-range compounds in soil samples and determined that effects on groundwater were unlikely. Metals were reported in all soil and groundwater samples at concentrations well below environmental screening limits and may represent background concentrations for the area. The geophysical survey did not identify any underground heating oil tanks, wells, and septic systems that were not detected in the site reconnaissance (Crawford & Associates Inc. 2016).

4.7.3 Regulatory Setting

The following federal, state, and local laws and policies related to hazards and hazardous materials apply to the proposed project.

FEDERAL

Federal laws require planning to ensure that hazardous materials are properly handled, used, stored, and disposed of, and if such materials are accidentally released, to prevent or mitigate injury to health or the environment. The U.S. Environmental Protection Agency (EPA) is the agency primarily responsible for enforcement and implementation of federal laws and regulations pertaining to hazardous materials. Applicable federal regulations are primarily contained in CFR Titles 29, 40, and 49. Hazardous materials, as defined in the CFR, are listed in 49 CFR 172.101.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act of 1976 (RCRA) (42 U.S. Code [USC] 6901 et seq.) is the law under which EPA regulates hazardous waste from the time the waste is generated until its final

disposal ("cradle to grave"). EPA has authorized the California Department of Toxic Substances Control (DTSC) to enforce hazardous waste laws and regulations in California. Under RCRA, DTSC has the authority to implement permitting, inspection, compliance, and corrective action programs to ensure that people who manage hazardous waste follow state and federal requirements. Generators must ensure that their wastes are disposed of properly, and legal requirements dictate the disposal requirements for many waste streams (e.g., banning many types of hazardous wastes from landfills).

Superfund Amendments and Reauthorization Act

The Superfund Amendments and Reauthorization Act of 1986 (Public Law 99-499; USC Title 42, Chapter 116), also known as the Emergency Planning and Community Right-to-Know Act (EPCRA) of 1986, imposes hazardous materials planning requirements to help protect local communities in the event of accidental release. EPCRA requires states and local emergency planning groups to develop community emergency response plans for protection from a list of extremely hazardous substances (40 CFR 355 Appendix A). In California, EPCRA is implemented through the California Accidental Release Prevention Program.

Occupational Safety and Health Standards

The federal Occupational Safety and Health Administration (OSHA) is the agency responsible for assuring worker safety in the handling and use of chemicals identified in the Occupational Safety and Health Act of 1970 (Public Law 91-596, 9 USC 651 et seq.). OSHA has adopted numerous regulations pertaining to worker safety, contained in CFR Title 29. These regulations set standards for safe workplaces and work practices, including standards relating to the handling of hazardous materials and those required for excavation and trenching.

STATE

The primary state agencies with jurisdiction over hazardous materials management are DTSC and the Regional Water Quality Control Board. Other state agencies involved in hazardous materials management are the California OSHA (Cal/OSHA), the California Governor's Office of Emergency Services, California Department of Fish and Wildlife, Air Resources Board, California Department of Transportation (Caltrans), and California Integrated Waste Management Board.

California Public Resources Code Section 21151.4

California Public Resources Code Section 21151.4 requires the lead agency to consult with any school district with jurisdiction over a school within 0.25-mile of a project about potential impacts on the school if the project might reasonably be anticipated to emit hazardous air emissions, or handle an extremely hazardous substance or a mixture containing an extremely hazardous substance.

California Government Code Section 65962.5

California Government Code Section 65962.5 requires DTSC to compile and maintain lists of potentially contaminated sites located throughout the State of California. This "Cortese List" includes hazardous waste and substance sites from DTSC's database, leaking UST sites from the SWRCB's database, solid waste disposal sites with waste constituents above hazardous waste levels outside of the waste management unit, Cease and Desist Orders and Cleanup and Abatement Orders concerning hazardous wastes, and hazardous waste facilities subject to corrective action pursuant to Section 25187.5 of the Health and Safety Code.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

In January 1996, the California Environmental Protection Agency adopted regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program). The six program elements of the Unified Program are: hazardous waste generators and

hazardous waste on-site treatment, USTs, aboveground storage tanks, hazardous material release response plans and inventories, risk management plans, and Uniform Fire Code hazardous materials management plans and inventories. The program is implemented at the local level by a local agency – the Certified Unified Program Agency (CUPA). The CUPA is responsible for consolidating the administration of the six program elements within its jurisdiction. The Roseville Fire Department is the CUPA for the City of Roseville.

Hazardous Materials Release Response Plans and Inventory Law

The Hazardous Materials Release Response Plans and Inventory Law aims to minimize the potential for accidents involving hazardous materials and to facilitate an appropriate response to possible hazardous materials emergencies. The law requires businesses that use hazardous materials to provide inventories of those materials to designated emergency response agencies, to illustrate on a diagram where the materials are stored onsite, to prepare an emergency response plan, and to train employees to use the materials safely.

The California Health and Safety Code, Underground Storage Tank Regulations

Chapter 6.7 of the Health and Safety Code outlines the requirements for USTs. The code identifies requirements for corrective actions, cleanup funds, liability, and the responsibilities of owners and operators of USTs.

Worker and Workplace Hazardous Materials and Worker Safety

Cal/OSHA is responsible for developing and enforcing workplace safety standards and assuring worker safety in the handling and use of hazardous materials. Among other requirements, Cal/OSHA obligates many businesses to prepare Injury and Illness Prevention Plans and Chemical Hygiene Plans. The Hazard Communication Standard requires that workers are informed of the hazards associated with the materials they handle. For example, manufacturers are to appropriately label containers, material safety data sheets are to be available in the workplace, and employers are to properly train workers.

Cal/OSHA assumes primary responsibility for developing and enforcing workplace safety regulations within the state. Cal/OSHA standards are typically more stringent than federal OSHA regulations and are presented in Title 8 of the CCR.

Transport of Hazardous Materials and Hazardous Materials Emergency Response Plan

The State of California has adopted U.S. Department of Transportation regulations for the movement of hazardous materials originating within the state and passing through the state. State regulations are contained in Title 26 of the CCR. State agencies with primary responsibility for enforcing state regulations and responding to hazardous materials transportation emergencies are the California Highway Patrol and Caltrans. Together, these agencies determine container types used and license hazardous waste haulers to transport hazardous waste on public roads.

The State of California has developed an emergency response plan to coordinate emergency services provided by federal, state, and local governments and private agencies. Response to hazardous materials incidents is one part of the plan. The plan is managed by the Office of Emergency Services, which coordinates the responses of other agencies in the area.

California Fire Code

The California Fire Code (CFC) establishes standards for the storage of hazardous materials. The CFC also requires the fire chief to be notified immediately when an unauthorized discharge becomes reportable under state, federal, or local regulations. Section 503 of the CFC establishes requirements for fire apparatus access roads.

Caltrans Standards Specifications

The Federal Highway Administration is the National Environmental Policy Act (NEPA) lead agency for the project. Through a NEPA Assignment Memorandum of Understanding, Caltrans is serving the Federal Highway Administration's role as the NEPA lead agency. Therefore, the project would be required to comply with Caltrans' Standard Specifications. Section 14-11 includes regulations relating to hazardous waste and contamination. Specifically, Section 14-11.02 requires the immediate stop of work upon discover of unanticipated asbestos or a hazardous substance, Section 14-11.04 regulates dust control, and Section 14-11.5 regulates stock piling.

LOCAL

Roseville Multi-Hazard Mitigation Plan

The Roseville City Council adopted the Roseville Multi-Hazard Mitigation Plan (RMHMP) on July 20, 2005. The most recent update was submitted to California Governor's Office of Emergency Service in October 2016. This hazard mitigation plan update identifies resources, information, and strategies for reducing risk from natural hazards. The plan will help guide and coordinate mitigation activities throughout the City.

City of Roseville Fire Department Hazardous Materials Response Plan and Fire Prevention and Life Safety Standards

The RFD has primary responsibility for emergency response and is staffed with its own Hazardous Materials Response Team. RFD inspects and monitors facilities that are required to comply with federal and state regulations concerning inventory and reporting of hazardous materials.

The RFD has developed a Hazardous Materials Response Plan that describes organizational and operational responsibilities, including cleanup and decontamination procedures, in the event of a hazardous materials emergency. RFD has also published standards, which are adopted by the City Council and contained in the Roseville Municipal Code and Roseville Fire Code Ordinance that modify applicable state regulations.

The Emergency Vehicle Access standard provides guidelines pertaining to the creation and maintenance of fire department access roadways required by Section 503 of the 2013 CFC, as amended by local ordinance. Access plans must be submitted as part of the civil improvement package, and construction is prohibited until the plans have been approved.

City of Roseville Design and Construction Standards

The City of Roseville's Design and Construction Standards (last amended in April of 2015) provide a reference to the City's requirements for the design and construction of civil improvement projects, which are to be dedicated to the public and accepted by the City for maintenance or operation, and to provide for coordinated development of those facilities to be used by and for the protection of the public.

City of Roseville Guidance for Stormwater Quality Best Management Practices

Control of construction site stormwater runoff is required by the NPDES stormwater permit that the SWRCB issued the City in 2013. The *West Placer Storm Water Quality Design Manual* (Placer County et al. 2016) is designed to facilitate compliance with the City's Stormwater Management Plan. The manual includes a discussion specific to pre-construction evaluation of potential for existing soil or groundwater contamination and appropriate selection of design measures.

See Section 4.8, "Hydrology and Water Quality," for additional discussion of stormwater pollution prevention plan requirements and best management practices.

City of Roseville Emergency Operations Plan

The City of Roseville Emergency Operations Plan addresses planned response to extraordinary emergency situations associated with natural disasters, technological (human-caused) emergencies, and war emergency operations in, or affecting, the City of Roseville. The plan establishes an emergency management organization and the emergency operations center for field response. It is designed to guide users through emergency preparedness, response, recovery, and mitigation.

4.7.4 Impacts

METHODS OF ANALYSIS

This analysis is based on the results of the Initial Site Assessment (ENGEO 2015) and analysis of site conditions. Potential impacts resulting from project construction and use were determined by evaluating the relative potential for a hazardous condition to result from project implementation and the sensitivity of potential receptors to such conditions.

THRESHOLDS OF SIGNIFICANCE

Based on Appendix G of the CEQA Guidelines, the proposed project was determined to result in a significant impact because of hazards or hazardous materials if it would:

- create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;
- create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or wastes within 0.25-mile of an existing or proposed school;
- be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would create a significant hazard to the public or the environment;
- for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport of public use airport, result in a safety hazard for people residing or working in the project area;
- for a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area;
- impair implementation of, or physically interfere with, an adopted emergency evacuation plan or emergency response plan; or
- expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are located adjacent to urbanized areas or where residences are intermixed with wildlands.

ISSUES OR POTENTIAL IMPACTS NOT DISCUSSED FURTHER

There are no sites on the Cortese List, as established pursuant to Government Code Section 65962.5, within the boundaries of the project site. Therefore, the potential for a significant hazard to the public or the environment due to location of the project on such a hazardous materials site is not evaluated further.

There are no airports in close proximity to the project site. There are two private helistop facilities within Roseville at the Sutter and Kaiser hospitals (located approximately 2 miles and 1 mile north of the project site, respectively). Potential impacts related to airports or the helistop facilities are not discussed further.

IMPACT ANALYSIS

Impact 4.7-1	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.
Applicable Policies and Regulations	RCRA, EPCRA, OSHA and Cal/OSHA standards, Hazardous Materials Response Plans and Inventory Law, CFC, RMHMP, RFD Hazardous Materials Response Plan and Standards, City of Roseville Stormwater Quality permitting requirements
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

The proposed project would involve construction activities such as site preparation, grading, and paving. These activities require the storage, use, and transport of potentially hazardous materials such as fuels, oils, paints, and adhesives. Construction workers, nearby persons or residents, and the surrounding environment could be exposed to hazards associated with accidental releases of the materials, whether through improper handling, unsound disposal methods, transportation accidents, or fires, explosions, or other emergencies.

Contractors would be required to comply with applicable federal, state, and local regulations for handling hazardous material. The requirements include reporting accidental release of hazardous materials. The City's established hazardous material emergency response plan and general emergency response plan would also reduce the potential for harm from accidental release by facilitating timely response to the release of potentially hazardous materials. The RFD is available to respond to hazardous materials complaints or emergencies, if any, during construction.

The City would implement the following plans and special provisions as part of the proposed project to avoid a significant hazard to the public or environment during construction:

- Comply with the RMHMP, which requires contractors to transport and store materials in appropriate and approved containers along designated truck routes, maintain required clearances, and handle materials using fire department.
- Implement a spill prevention and control plan to minimize the exposure of people and the environment to potentially hazardous materials. The spill prevention and control plan would ensure transport, storage, and handling of hazardous materials required for construction is consistent with relevant regulations and guidelines.
- Comply with the City of Roseville Design and Construction Standards and the *West Placer Storm Water Quality Design Manual* (Placer County et al. 2016).

Compliance with these plans would be achieved through the following project commitments:

- All heavy equipment would be stored in the designated staging areas and checked by the City inspector and maintained daily to prevent leaks of materials that if introduced to water could be deleterious to aquatic life.
- Raw cement/concrete (or washings thereof), asphalt, paint or other coating material, oil or other petroleum products, or any other substances associated with project-related activities that could be

hazardous to aquatic life would be prevented from contaminating the soil or entering creek channels.

- No materials would be placed in the creek channels, except as shown on the project plans. All debris and waste would be picked up daily and properly disposed of at an appropriate site. All construction debris and associated materials would be removed from the work site upon completion of the project.

Use-related Impacts

Hazardous materials would continue to be used and transported in varying amounts during long-term use of the proposed trail project. For example, weed control chemicals and asphalt for patching/crack sealing may be used by City employees or contractors during path maintenance. All maintenance materials required for project use (e.g., oils, grease, lubricants, antifreeze, and similar materials) would be stored off-site.

The project would continue to comply with applicable federal, state, and local regulations, including the City's Multi-Hazard Mitigation Plan. The City's established hazardous material emergency response plan and general emergency response plan would continue to apply to project use, and RFD would be available to respond to hazardous materials complaints or emergencies.

Conclusion

Because the proposed project would be required to implement and comply with existing hazardous material regulations, impacts related to the creation of significant hazards to the public or environment through the routine transport, use, and disposal of hazardous materials would be unlikely. Implementation and compliance with the uniformly applicable plans, standards, and special provisions described above would maintain any potential impacts during construction or trail use at a **less-than-significant** level.

Alignment Option 1A

Both construction and use-related activities under Option 1A would be the same type and general magnitude as would occur under the Proposed Trail Alignment. Because the proposed project would be required to implement and comply with existing hazardous material regulations, impacts related to the creation of significant hazards to the public or environment through the routine transport, use, and disposal of hazardous materials would be unlikely. The impact would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 1C

Both construction and use-related activities under Option 1C would be the same type and general magnitude as would occur under the Proposed Trail Alignment. Implementation of this alignment option would not substantially change the potential for creation of significant hazards to the public or environment through the routine transport, use, and disposal of hazardous materials because the proposed project would be required to implement and comply with existing hazardous material regulations. The impact would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 5A

Both construction and use-related activities under Option 5A would be the same type and general magnitude as would occur under the Proposed Trail Alignment. Implementation of this alignment option would not substantially change the potential for creation of significant hazards to the public or environment through the routine transport, use, and disposal of hazardous materials because the proposed project would be required to implement and comply with existing hazardous material regulations. The impact would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Mitigation Measures

None required.

Impact 4.7-2	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release or hazardous materials into the environment.
Applicable Policies and Regulations	EPCRA, OSHA and Cal/OSHA standards, California UST regulations, Caltrans' Standard Specifications, the Unified Program, CFC, RMHMP, RFD Hazardous Materials Response Plan and Standards
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

Most of the proposed trail alignment is located within greenbelts along Dry, Cirby, and Linda Creeks that are undeveloped open space. The site reconnaissance and records review conducted in the Initial Site Assessment and Limited Site Assessment did not find documentation or physical evidence of soil or groundwater impairment associated with current or past uses of the project site or contaminated facilities that would reasonably be expected to impact the project site (ENGEO 2015; Crawford & Associates 2016). Based on this, there is a low risk of encountering soil or groundwater affected by materials release in these areas during construction of the proposed project. Although soil and groundwater sampling in the portion of the project site that extends through an industrial area along Riverside Avenue between Darling Way and Kenroy Lane did not identify any existing contamination, the potential to encounter unanticipated hazards is greater in this area (Crawford & Associates Inc. 2016). In addition, although none were detected in surveys, there is also a potential that underground heating oil tanks, wells, and septic systems remain on the property. If discovered, any remaining USTs, wells, and septic systems would need to be properly abandoned in accordance with City permit requirements.

Properties of potential concern include:

- 645 Riverside Avenue, which is in a commercial/industrial area and has had buildings constructed on the property since before 1947;
- 649 Riverside Avenue, which is in an industrial area and was developed with structures from at least 1947 to 1971; and
- 110 Darling Way, which is in an industrial area and was occupied prior to 1952, and is adjacent to a LUST case where soil vapor extraction and air sparge[1] remediation was performed.

There is also an ongoing investigation of PCE in shallow soil gas near the intersection of Darling Way and Riverside Avenue. PCE is not expected to have affected the project site, however; based on the direction of groundwater flow, the project site is upgradient of this contamination.

The disturbance of undocumented and unexpected hazardous wastes could also result in hazards to the environment and human health. Adverse impacts could result if construction activities inadvertently disperse contaminated material into the environment. Potential hazards to human health include ignition of flammable liquids or vapors, inhalation of toxic vapors in confined spaces such as trenches, and skin

[1] Air sparging is a subsurface contaminant remediation technique that involves the injection of pressurized air into contaminated groundwater, which changes the hydrocarbons from a dissolved to vapor state. The air is then sent to a vacuum extraction system to remove the contaminants.

contact with contaminated soil or water. In addition, inadvertent disturbance of asbestos in underground utilities could result in airborne asbestos fibers. Caltrans' Standard Specifications, Section 14-11 addresses discovery of hazardous materials and contamination during the course of construction work. It states that when the presence of asbestos or hazardous substances are not shown on the plans or indicated in the specifications and a construction contractor encounters materials that the Contractor reasonably believes to be asbestos or a hazardous substance as defined in Section 25914.1 of the Health and Safety Code, and the asbestos or hazardous substance has not been rendered harmless, the contractor may continue work in unaffected areas reasonably believed to be safe. The contractor would immediately cease work in the affected area and report the condition to the project engineer in writing. Following the standard specifications, the contractor would sample the affected area to determine if the material is hazardous and would develop a Sampling and Analysis Plan (SAP) to outline how to analyze, abate, manifest, transport, and dispose of all special and hazardous material as required by law. The SAP would be submitted to the City and would describe how the contractor intends to complete the work plan. The work plan would include the general order of work, a site-specific worker health and safety plan, and a SAP for testing of potentially hazardous materials. It would also include a list of disposal sites the contractor expects to use for the various type of waste and recyclables.

Conclusion

Incorporation of standard best management practices and avoidance measures into the project, as discussed above under Impact 4.7-1, and coordination with regulatory agencies would reduce the potential for negative effects that could result from construction on known contaminated sites. Compliance with standard construction specifications, including Caltrans' Standard Specifications, Section 14-11, would reduce the potential for negative effects that could result from undocumented contamination that has not been characterized or remediated. Therefore, this would be a **less-than-significant** impact.

Alignment Option 1A

Option 1A would result in construction proximate to the same properties of potential concern identified above for the Proposed Trail Alignment. The potential for trail construction to affect these properties would be the same as discussed for the Proposed Trail Alignment, except that Alignment Option 1A may require more activity in the southwest corner of the access and staging area on Riverside Avenue, which is the site of the former facilities at 649 Riverside Avenue. Option 1A would also reduce the area of temporary impacts by 0.40 acre, which would result in a proportional reduction in the potential to encounter undocumented contamination that has not been characterized or remediated. Based on these overall similarities and the existing regulations for known and unknown contamination, the impact associated with implementing Option 1A would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 1C

Option 1C would shift trail construction at the westernmost end of the project site from the west side of Dry Creek to the east side. This would separate earthwork that could encounter hazardous materials from the industrial and commercial properties along Riverside Avenue more than the Proposed Trail Alignment. Option 1C would also reduce the area of temporary impacts by approximately 0.57 acre, which would result in a proportional reduction in the potential to encounter undocumented contamination that has not been characterized or remediated. However, Alignment Option 1C would still include construction of the proposed trailhead and parking area on the west side of Dry Creek adjacent to the industrial and commercial properties on Riverside Avenue. Based on these overall similarities and the existing regulations for known and unknown contamination, the impact associated with implementing Option 1C would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 5A
Option 5A would not alter the potential for trail construction to affect properties of potential concern in the portion of the project site that extends through an industrial area along Riverside Avenue between Darling Way and Kenroy Lane, However, the alignment would increase the area of temporary impacts by 0.13 acre, which would result in a proportional increase in the potential to encounter undocumented contamination that has not been characterized or remediated. Based on these overall similarities and the existing regulations for known and unknown contamination, the impact associated with implementing Option 5A would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Mitigation Measures
None required.

Impact 4.7-3	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or wastes within 0.25 mile if an existing or proposed school.
Applicable Policies and Regulations	RCRA, EPCRA, OSHA and Cal/OSHA Standards, Unified Program, California Highway Patrol and Caltrans hazardous materials transport regulations, RMHMP, RFD Hazardous Materials Response Plan and Standards
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
Schools are considered a particularly sensitive receptor relative to hazardous material exposure because there is a concentration of children that is repeatedly exposed to environmental conditions at the school site for extended periods of time. As discussed above, there are three school sites within 0.25 mile of the project site, including a combination preschool and elementary school site, a middle school, and a private school. Also, as described in the environmental setting, no soil contamination was identified during the Initial Site Assessment. Furthermore, as described above under Impact 4.7-1, no significant emissions of hazardous materials would be anticipated during construction or use of the proposed project. And, because of the linear nature of the project, construction activities requiring the use of hazardous materials would occur for a limited duration in the general vicinity of each of the school sites.

During construction, demolition, and excavation activities, the project would potentially produce hazardous air emissions or involve the handling of hazardous wastes. As discussed above, the project would comply with federal and state regulations that are designed to reduce the potential for the release of large quantities of hazardous materials and wastes into the environment to an acceptable level. Existing protective measures and regulations would be sufficient to ensure that hazardous materials stored, used, transported, and disposed of as part of the proposed project would not pose a significant hazard to the public or the environment, including children at schools, under normal conditions.

Conclusion
Due to the limited quantities of potentially hazardous materials required for construction of the project and the applicability of federal, state, and local regulations that would reduce the potential for hazards associated with the transport, use, and storage of hazardous materials, the project would have a **less-than-significant** impact.

Alignment Option 1A
Implementing Alignment Option 1A would not change the proximity of construction activities to the identified school sites. Both construction and use-related activities for Option 1A would be the same type and general magnitude of activities as would occur under the Proposed Trail Alignment. The impact would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 1C
Implementing Alignment Option 1C would not change the proximity of construction activities to the identified school sites. Both construction and use-related activities for Option 1C would be the same type and general magnitude of activities as would occur under the Proposed Trail Alignment. The impact would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 5A
Implementing Alignment Option 5A would not change the proximity of construction activities to the identified school sites. Both construction and use-related activities for Option 5A would be the same type and general magnitude of activities as would occur under the Proposed Trail Alignment. The impact would be **less than significant** for the same reasons discussed above for the Proposed Trail Alignment.

Mitigation Measures

None required.

Impact 4.7-4	Impair implementation of, or physically interfere with, an adopted emergency evacuation plan or emergency response plan.
Applicable Policies and Regulations	City of Roseville Emergency Operations Plan, City of Roseville Design and Construction Standards, Hazard Mitigation Plan
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
Trail construction may involve the closure of traffic lanes where trails intersect with streets. The City of Roseville's Design and Construction Standards require that roadwork requiring traffic lane closure be accepted by the City of Roseville Public Works Department. Per the Design and Construction Standards, the project's contractor will implement traffic control measures in accordance with local, state and federal requirements. The construction documents would require the contractor to develop a traffic control plan to provide safe passage to vehicles and pedestrians through the work zone where traffic is allowed. These regulations further require that the police and fire departments, ambulance services, schools, and bus systems receive 48 hours of notice in advance of road closures.

Use-related Impacts
After completion, the proposed multi-use trail would improve access to the Dry Creek, Cirby Creek, and Linda Creek open space areas. Per the Design and Construction standards, the desired vertical clearance at undercrossings would be 12 feet to allow for passage of fire vehicle access. In constrained

areas or where fire vehicle access is not needed, the minimum vertical clearance at undercrossings would be 9 feet.

Conclusion

Construction of the trail could require temporary lane closures in limited locations where the trail would cross underneath a road, which may affect traffic and emergency access. Compliance with the Design and Construction Standards that require noticing of emergency services prior to road closures would permit emergency services adequate time to identify alternate routes and avoid impedance of access through locations of potential congestion. During use, enhanced access may benefit fire and police response to emergencies in these areas. This impact would be **less than significant**.

Alignment Option 1A

Construction and use-related activities associated with implementation of Option 1A would be of the same type and general magnitude as would occur with the Proposed Trail Alignment. This option would have a **less-than-significant** impact on emergency evacuation or response plans for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 1C

Construction and use-related activities associated with implementation of Option 1C would be of the same type and general magnitude as would occur with the Proposed Trail Alignment. This option would have a **less-than-significant** impact on emergency evacuation or response plans for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 5A

Construction and use-related activities associated with implementation of Option 5A would be of the same type and general magnitude as would occur with the Proposed Trail Alignment. This option would have a **less-than-significant** impact on emergency evacuation or response plans for the same reasons discussed above for the Proposed Trail Alignment.

Mitigation Measures

None required.

Impact 4.7-5	Expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are located adjacent to urbanized areas or where residences are intermixed with wildlands during project construction.
Applicable Policies and Regulations	CFC, RMHMP, City of Roseville's Design and Construction Standards
Significance with Policies and Regulations	Proposed Project: Potentially significant Alignment Option 1A: Potentially significant Alignment Option 1C: Potentially significant Alignment Option 5A: Potentially significant
Mitigation Measures	Mitigation Measure 4.7-5 (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

Potential losses from wildfire include human life, structures, and other improvements, and natural resources. There are no recorded incidents of loss of life from wildfires in Roseville, and the risk from wildfire has been deemed moderate by both the State and the RFD. Given the immediate response times to reported fires, the likelihood of injuries and casualties is generally low in the project area (City of Roseville 2005).

The Dry Creek Greenway East Trail would be constructed through open space areas where there is a risk of wildfire ignition. The risk is greatest in the dry summer months when drought conditions and dying trees and vegetation create fire-prone conditions. Trail construction has the potential to increase the risk of wildfires by introducing construction vehicles and equipment, such as power tools and torches, that may create sparks and ignite dry vegetation.

Conclusion

Construction activities would have a **potentially significant** impact related to exposure of people or structures to wildland fire because construction activities could ignite the dry grasses on, and adjacent to, the project site.

Alignment Option 1A

Construction activities associated with implementation of Option 1A would be of the same type and general magnitude as would occur with the Proposed Trail Alignment. This option would have a **potentially significant** impact related to exposure of people or structures to wildland fire during project construction for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 1C

Construction activities associated with implementation of Option 1C would be of the same type and general magnitude as would occur with the Proposed Trail Alignment. This option would have a **potentially significant** impact related to exposure of people or structures to wildland fire during project construction for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 5A

Construction activities associated with implementation of Option 5A would be of the same type and general magnitude as would occur with the Proposed Trail Alignment. This option would have a **potentially significant** impact related to exposure of people or structures to wildland fire during project construction for the same reasons discussed above for the Proposed Trail Alignment.

Mitigation Measures

Mitigation Measure 4.7-5: Clear flammable materials within the project site prior to construction.

This mitigation would apply for the Proposed Trail Alignment, Alignment Options 1A, 1C, and 5A.

If dry vegetation or other fire fuels exist on or near staging areas, welding areas, or any other area on which equipment will be operated, contractors shall clear the immediate area of fire fuel prior to construction. To the extent feasible, areas subject to construction activities will be maintained free of fire fuel and debris during the course of construction. To avoid impacts to natural resources, areas to be cleared and appropriate clearing methods shall be identified with the assistance of a qualified biologist.

Significance after Mitigation

Implementation of this mitigation measure would reduce significant construction-related impacts associated with the potential for loss, injury, or death due to wildfire to a **less-than-significant** level by removing fire fuels from construction sites and substantially decreasing the potential for construction activities to ignite a wildfire.

Impact 4.7-6	Use-related exposure of people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are located adjacent to urbanized areas or where residences are intermixed with wildlands.
Applicable Policies and Regulations	CFC, RMHMP, City of Roseville's Design and Construction Standards
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

Potential losses from wildfire include human life, structures, and other improvements, and natural resources. There are no recorded incidents of loss of life from wildfires in Roseville, and the risk from wildfire has been deemed moderate by both the State and the RFD. Given the immediate response times to reported fires, the likelihood of injuries and casualties is generally low in the project area (City of Roseville 2005).

The introduction of persons into open space, including maintenance workers and bike path users, has the potential to increase the risk of fire (City of Roseville 2008). However, much of the project site is already public land and can be accessed on segments of existing trails or unrestricted access points along and at the ends of public streets. The proposed trail would be designed to meet RFD's guidelines for trail construction to the extent feasible (see Impact 4.7-4, above); therefore, it would provide improved access to emergency responders compared to current conditions. The guidelines facilitate RFD's access to open space and enhance its ability to respond to wildfires. In addition, the City of Roseville has adopted several policies that are intended to reduce the risk of wildfires within open space and to reduce the potential for harm to people or structures resulting from wildfires. These include the City's Multi-Hazard Mitigation Plan, which identifies risk reduction measures for wildfires, including clearing potential fuels, implementing best management practices on public lands, and using goat grazing in City open space and preserve areas. RFD also actively promotes the creation of fire breaks between open space areas and adjoining developed properties. Active control of weeds adjacent to bike trails in all open space areas is conducted by the Parks & Recreation Department and Public Works Department, reducing the potential for accidental fires started by trail users or maintenance worker vehicles.

Conclusion

City of Roseville measures and policies, including RFD and the City's Multi-Hazard Mitigation Plan, would limit exposure to wildland fires from use of the trail, so trail use would not expose people or structures to significant hazards related to wildland fires (City of Roseville 2008). This impact would be **less than significant**.

Alignment Option 1A

Use-related activities associated with implementation of Option 1A would be of the same type and general magnitude as would occur with the Proposed Trail Alignment. This option would have a **less-than-significant** impact for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 1C
Construction and use-related activities associated with implementation of Option 1C would be of the same type and general magnitude as would occur with the Proposed Trail Alignment. This option would have a **less-than-significant** impact for the same reasons discussed above for the Proposed Trail Alignment.

Alignment Option 5A
Construction and use-related activities associated with implementation of Option 5A would be of the same type and general magnitude as would occur with the Proposed Trail Alignment. This option would have a **less-than-significant** impact for the same reasons discussed above for the Proposed Trail Alignment.

Mitigation Measures

None required.

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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

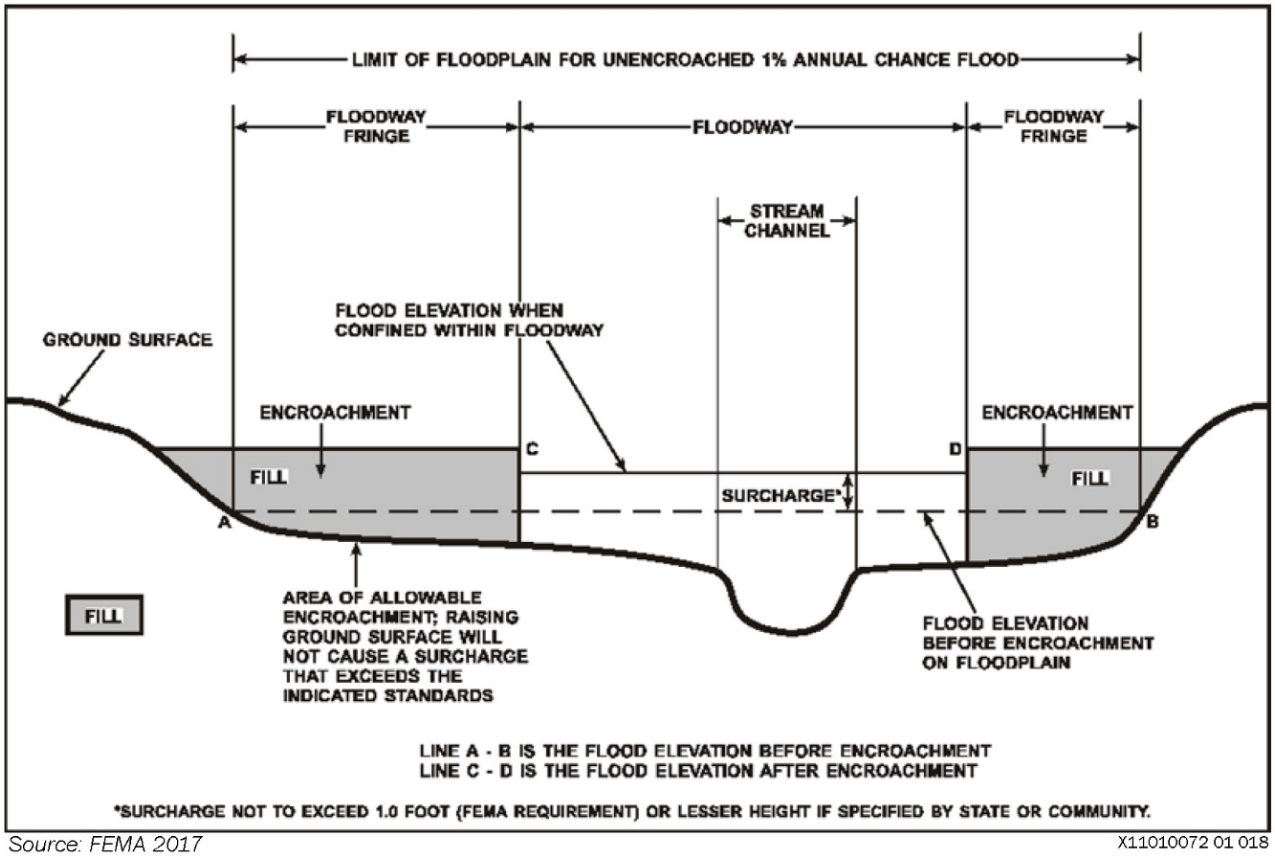
The project area is located in the Lower American hydrologic unit (HUC 18020111) within the Dry Creek watershed. The project area encompasses portions of Strap Ravine, Linda Creek, Cirby Creek, and Dry Creek. Linda Creek flows in a generally northwest direction towards Cirby Creek. Strap Ravine is a 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

Legend

- Project Site
- City of Roseville 100-year Floodplain
- FEMA 100-year Floodplain

0 500 1,000 Feet

ESRI Basemap G11010072 01 021

Source: Data received from the City of Roseville in 2018

Exhibit 4.8-2

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

ASCENT ENVIRONMENTAL

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 ≤ 20°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 CVPFB 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 (sofit) 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 Thread Discharges of Treated/Untreated Groundwater from Cleanup Sites, Wastewater from Superchlorination Projects, and Other Limited Thread 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 feasible[1] 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.

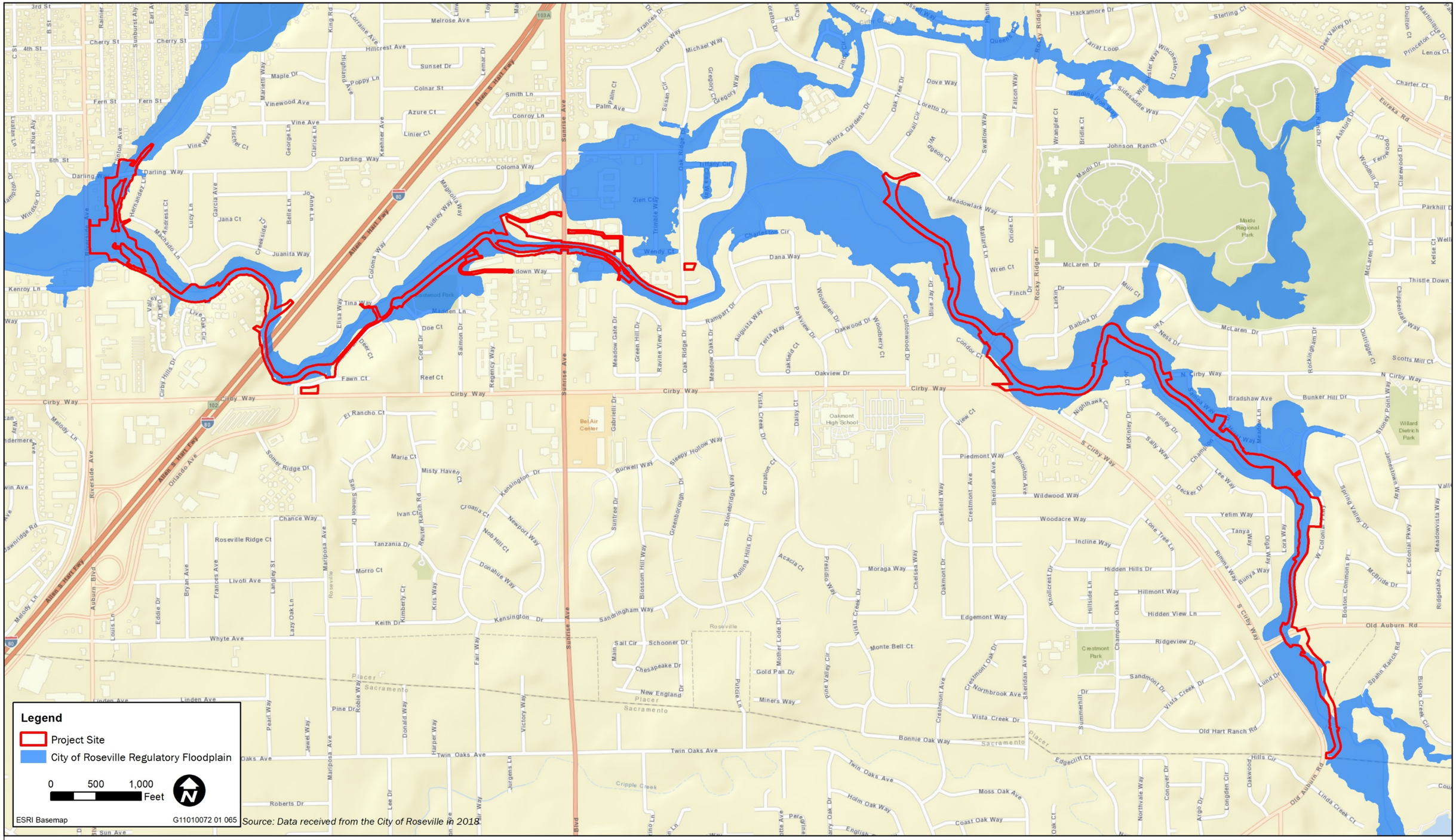


Exhibit 4.8-3

City of Roseville Regulatory Floodplain

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 Sate 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 to 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

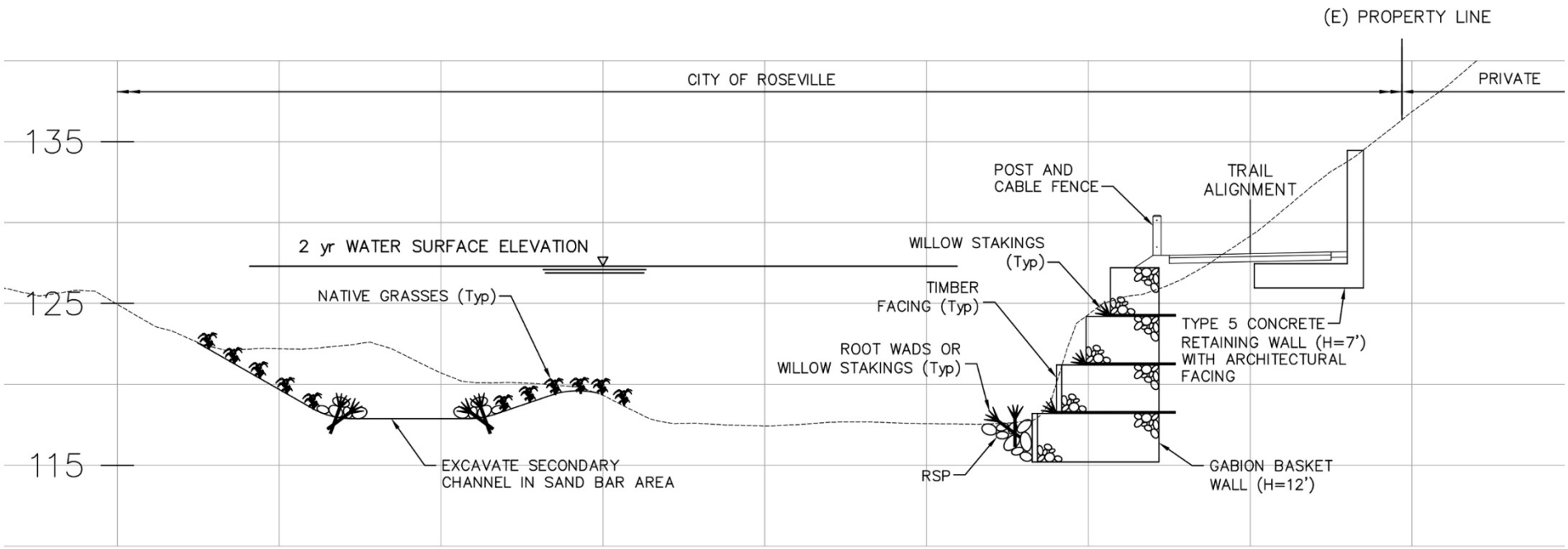
Disturbance Type	Bridges	Bank Stabilization	Undercrossings	Total
Permanent Disturbance				
Loss of streambed (square feet)	9	1,236	0	**1,245**
Temporary Disturbance				
Disturbance below the Ordinary High-Water Mark (acres)	0.26	0.26	0.22	**0.74**
Disturbance within Low Flow Channel (acres)	0.06	0.12	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 steam 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

Exhibit 4.8-4

Cirby Creek Potential Streambank Stabilization Example

ASCENT ENVIRONMENTAL

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 patters 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 patters 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 patters 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 sofit 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 sofits 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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