Enchanted Hills Park Project

Initial Study/
Mitigated Negative Declaration #2350

ADPR #19-05193

January 2020 | COP-04

Prepared for:

City of Perris Planning Division
135 North D Street
Perris, CA 92570

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

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January 29, 2020 | COP-04

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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
ACBCI	Agua Caliente Band of Cahuilla Indians
amsl	above mean sea level
APN	Assessor's Parcel Number
AQMP	Air Quality Management Plan
BLM	Bureau of Land Management
BMPs	Best Management Practices
BMX	bicycle motocross
CAL FIRE	California Department of Forestry and Fire Protection
CalEEMod	California Emissions Estimator Model
CalRecycle	California Department of Resources and Recycling and Recovery
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CBC	California Building Code
CCR	California Code of Regulations
CDC	California Department of Conservation
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
cf	cubic feet
CFG	California Fish and Game
CH_4	methane
CNEL	Community Noise Equivalent Level
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
CRPR	California Rare Plant Rank
dB	decibel
dBA	A-weighted decibel
DBESP	Determination of Biologically Equivalent or Superior Preservation
DHS	Department of Health Services
DMA	drainage management area
DPM	diesel particulate matter
DTSC	Department of Toxic Substances Control
EIC	Eastern Information Center
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FMMP	Farmland Mapping and Monitoring Program

ACRONYMS AND ABBREVIATIONS (cont.)

GHG	greenhouse gas
HFC	hydrofluorocarbon
Hz	hertz
in/sec	inches/second
IS	Initial Study
kbtu	kilowatt British thermal unit
kW	kilowatt
LCFS	Low Carbon Fuel Standard
L_{EQ}	time averaged noise level
L_{MAX}	maximum noise level
LOS	Level of Service
LST	localized significance threshold
MBTA	Migratory Bird Treaty Act
MLD	Most Likely Descendent
MND	Mitigated Negative Declaration
MRZ	Mineral Resource Zone
MS4	Municipal Separate Storm Sewer System (Riverside County)
MSHCP	Multiple Species Habitat Conservation Plan
N_2O	nitrous oxide
NAHC	Native American Heritage Commission
NO_X	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PFC	perfluorocarbon
PFYC	Potential Fossil Yield Classification
PM_{10}	particulate matter less than 10 microns
$PM_{2.5}$	particulate matter less than 2.5 microns
ppd	pounds per day
PPV	peak particle velocity
ROG	reactive organic gas
RTP	Regional Transportation Plan
RWQCB	Regional Water Quality Control Board

ACRONYMS AND ABBREVIATIONS (cont.)

SB	Senate Bill
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SF_6	sulfur hexafluoride
SR	State Route
SRA	source receptor area
SWPPP	stormwater pollution prevention plan
SWRCB	State Water Resources Control Board
TAC	toxic air contaminant
UCR-ARU	University of California, Riverside Archaeological Research Unit
USACE	U.S. Army Corps of Engineers
USDOT	U.S. Department of Transportation
USFWS	U.S. Fish and Wildlife Service
VHFHSZ	Very High Fire Hazard Severity Zone
VMT	vehicle miles traveled
WQMP	Water Quality Management Plan

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1.0 INTRODUCTION

1.1 Purpose and Scope

Pursuant to the California Environmental Quality Act (CEQA) (California Public Resources Code, Sections 21000, et seq.), and the Guidelines for Implementation of CEQA (State CEQA Guidelines, California Code of Regulations, Title 14, Sections 15000 et seq.), this Initial Study/Mitigated Negative Declaration (IS/MND) has been prepared to determine the potentially significant impacts upon the environment resulting from the construction and operation of the Enchanted Hills Park (Project).

In accordance with Section 15063 of the State CEQA Guidelines, this IS/MND contains analysis conducted by the City of Perris as the Lead Agency to inform the Lead Agency decision makers, other affected agencies, and the public of potential environmental impacts associated with the implementation of the proposed Project. The City of Perris, as the Lead Agency, is charged with the responsibility of deciding whether or not to approve the Project.

1.2 Findings of the Initial Study

This IS/MND is based on an Environmental Checklist Form (Form) as suggested in Section 15063(d)(3) of the State CEQA Guidelines and it is the foundation of the format contained within Section 3.1 of this IS/MND. The Form is used to evaluate whether or not any significant environmental effects are associated with the implementation of the Project. As applicable, mitigation measures are included that reduce any potential significant impacts to a level that is less than significant. The environmental issue areas discussed in this IS/MND are as follows:

- Aesthetics
- Agriculture and Forestry Resources
- Air Quality
- Biological Resources
- Cultural Resources
- Energy
- Geology and Soils
- Greenhouse Gas Emissions
- Hazards and Hazardous Materials
- Hydrology and Water Quality
- Land Use and Planning
- Mineral Resources
- Noise
- Population and Housing
- Public Services
- Recreation
- Transportation
- Tribal Cultural Resources
- Utilities and Service Systems
- Wildfire
- Mandatory Findings of Significance

1.3 Contact Information

As noted, the City of Perris is the Lead Agency for the Project. Any questions about the preparation of the IS/MND, the analysis, or the conclusions should be referred to the following:

Nathan Perez, Senior Planner
City of Perris, Planning Division
135 North D Street
Perris, CA 92570
(951) 943-5003, Ext. 279

2.0 PROJECT DESCRIPTION

2.1 Project Site Location and Setting

The proposed Project site is located at the western boundary of the city of Perris in western Riverside County, approximately 50 miles east of the Pacific Ocean (see Figure 1, *Regional Location*). Perris is situated at an elevation of approximately 1,450 feet above mean sea level (amsl) and has a Mediterranean climate.

Specifically, the approximately 22.81-acre study area is bound by Metz Road to the north, Watson Road to the south, residential homes that front Altura Drive to the east, and Carter Drive to the west (see Figure 2, *Project Location*) The Project site includes Assessor's Parcel Numbers (APNs) 326-072-004, 326-062-017, 326-071-001, 326-071-002, 326-072-001, 326-072-002, 326-072-003, 326-072-004, 326-072-005, and 326-073-001. It is noted that the City has not been able to acquire a single parcel (APN 326-072-001) in the northern portion of the Project area; thus, this parcel is not included in the Project. However, to be conservative, this parcel was included as part of the environmental evaluation.

Currently the Project site is largely undeveloped; however, there are several trails, an unofficial bicycle motocross (BMX) course, signs of disturbance, and man-made features. Elevations within the study area range from approximately 1,690 feet (515 meters) amsl to 1,730 feet (527 meters) amsl. The site is generally flat with undulating topography, and several rock outcrops are located throughout the study area. One large boulder is painted with an image of an owl and is known unofficially by the community as Owl Rock.

Residential development surrounds the Project site on all sides, and beyond the housing undeveloped land occurs to the north and east. The Motte Rimrock Reserve, an ecological reserve that is part of the University of California Natural Reserve System, is approximately 300 feet north of the Project site.

2.2 Project Background and Description

The Enchanted Hills area was recognized by the City as a park-deficient community and subsequently, the City applied and was awarded funds through the California Department of Housing and Community Development to assist in the acquisition of parcels to create a park in the Enchanted Hills area of the City. Currently, the City has applied for a Proposition 68 – Statewide Park Development and Community Revitalization Program competitive grant to construct the park. Through a series of community outreach efforts, the City prepared a conceptual plan for the Project. The plan includes a combination of passive and active recreational features as discussed below.

The proposed Project consists of an active sports park (see Figure 3, *Site Plan*). While many natural features of the site would be retained, park development would include the introduction of hardscape and impermeable surfaces as well as turfed and landscaped areas. The park plan includes a multi-use field, child play area, toddler play area, restrooms, picnic shelters, hardscape, parking lots, bridges, trails, a basketball court, BMX course improvements, art rocks, a splash pad, a skating area, and a zip line. Additionally, the Project would retain and incorporate some of the existing site features, such as Owl Rock, and formalize the unofficial BMX course that exists on the site. There are three proposed entrances to the site; one at the intersection of Weston Road and Diana Street, and two entrances that form a horse-shoe drive adjacent to and accessible from Metz Road. The Project would include on-site

Source: Base Map Layers (ESRI, 2013)

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HELIX Environmental Planning

Regional Location

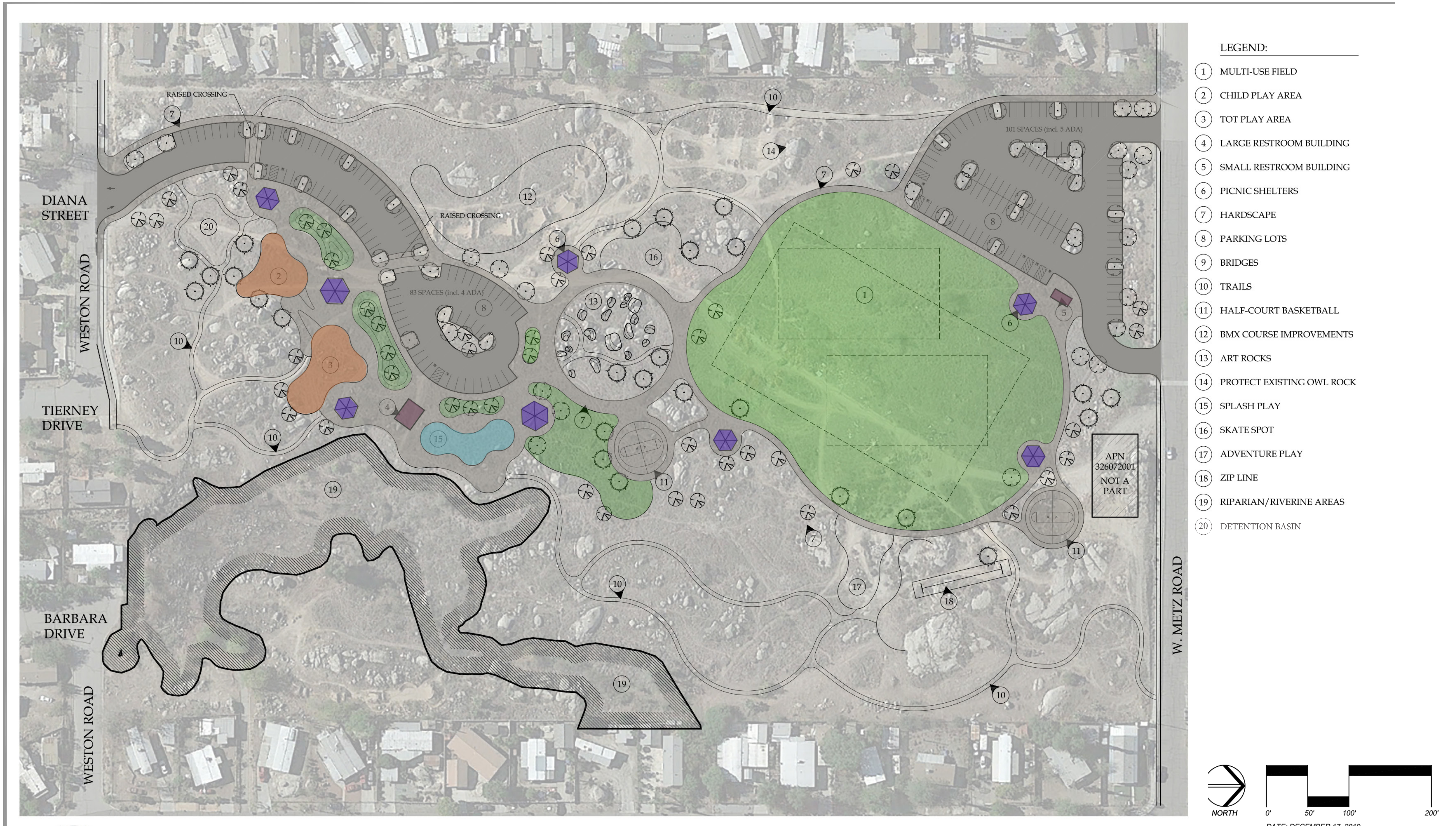
Figure 1

Source: Aerial (RCIT, 2016)

HELIX Environmental Planning

Project Location

Figure 2



Source: City of Perris 2019

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HELIX Environmental Planning

Site Plan

Figure 3

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signing and road striping , improving Weston Road and Metz Road to their full local street alignment along the Project boundary, and provide appropriate sight distance measures in accordance with Caltrans standards. Other support infrastructure includes the construction of an underground storm drain that would redirect offsite flows from the northern boundary to the riparian area and lighting for the parking lots, security, and the walking trail. The Project also includes the undergrounding of the electrical transmission line that traverses the southern portion of the site and while the exact alignment is unknown at this time, the alignment will avoid the riparian area that is to be preserved in its natural state.

The site is zoned as R5 – Mobile Home Subdivision and has a General Plan land use designation of R 6,000 (Single-Family Residential 6,000-square foot lot). However, the proposed Project would not require a General Plan amendment or zone change as the City allows parks in areas zoned and designated for residential land uses.

2.3 Project Approvals

The following public agencies whose approval is required include:

- Regional Water Quality Control Board (Santa Ana Region)
- California Department of Fish and Wildlife

2.4 Native American Tribal Coordination

Letters were sent to Native American tribes traditionally and culturally affiliated with the Project area in December 2019. Letters were sent on December 24, 2019 to Native American representatives and interested parties identified by the Native American Heritage Commission (NAHC). In a response dated January 9, 2020, the Agua Caliente Band of Cahuilla Indians (ACBCI) stated that although the Project is not located within the ACBCI Reservation, it is within the Tribe’s Traditional Use Area. As such, the Tribe requests a thorough description of the Project, copies of any cultural resource documentation generated in connection to the Project, and a copy of the records search with associated survey reports and site records from the information center. Additionally, in a response dated January 9, 2020, the Cahuilla Band of Indians stated that although the Project is not located within the Cahuilla Reservation, the site is within the Cahuilla Traditional Land Use Area. Therefore, the Tribe requests tribal monitors from Cahuilla be present during all ground disturbing activities and to be notified of all future Project updates. If any additional responses are received, they will be forwarded to City staff.

2.5 Documents Incorporated by Reference

- *Perris Comprehensive General Plan 2030*, City of Perris, originally approved on April 26, 2005 (Perris 2005a)
- *Perris General Plan 2030 Environmental Impact Report*, SCH No. 2004031135, certified April 26, 2005 (Perris 2005b)

2.6 Environmental Factors Potentially Affected

The environmental factors checked below would be potentially affected by this Project, involving at least one impact that is "Less than Significant with Mitigation Incorporated" as indicated by the checklist on the following pages.

☐ Aesthetics	☐ Agriculture and Forestry Resources	☐ Air Quality
■ Biological Resources	■ Cultural Resources	☐ Energy
☐ Geology and Soils	☐ Greenhouse Gas Emissions	☐ Hazards and Hazardous Materials
☐ Hydrology and Water Quality	■ Land Use and Planning	☐ Mineral Resources
■ Noise	☐ Population and Housing	☐ Public Services
■ Recreation	☐ Transportation	■ Tribal Cultural Resources
☐ Utilities and Service Systems	☐ Wildfire	■ Mandatory Findings of Significance

2.7 Determination

On the basis of this initial evaluation:

☐	I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
☑	I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because revisions in the project have been made by or agreed to by the project proponent. A MITIGATED NEGATIVE DECLARATION will be prepared.
☐	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.
☐	I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least one effect I) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.
☐	I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

[signature] 1-22-20

Signature Date

NATHAN PEREZ

Printed Name For

3.0 INITIAL STUDY

3.1 Environmental Checklist Form

As discussed in Section 1.0 of this IS/MND, this Section contains the Form for the Project. The Form is marked with findings as to the environmental effects of the Project.

The Lead Agency has defined the column headings in the environmental checklist as follows:

- "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

- "Less Than Significant with Mitigation Incorporated" applies where the inclusion of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." All mitigation measures are described, including a brief explanation of how the measures reduce the effect to a less than significant level.

- "Less Than Significant Impact" applies where the project does not create an impact that exceeds a stated significance threshold.

- "No Impact" applies where a project does not create an impact in that category. "No Impact" answers do not require an explanation if they are adequately supported by the information sources cited by the Lead Agency which show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project would not expose sensitive receptors to pollutants, based on a project specific screening analysis).

The explanation of each issue identifies the significance criteria or threshold used to evaluate each question; and the mitigation measure identified, if any, to reduce the impact to less than significance. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration [CEQA Guidelines Section 15063(c)(3)(D)]. Where appropriate, the discussion identifies the following:

a) Earlier Analyses Used. Identifies where earlier analyses are available for review.

b) Impacts Adequately Addressed. Identifies which effects from the checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and states whether such effects were addressed by mitigation measures based on the earlier analysis.

c) Mitigation Measures. For effects that are "Less Than Significant with Mitigation Incorporated," describes the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

I. AESTHETICS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Except as provided in Public Resources Code Section 21099, would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	■	☐
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	■
c) Substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?	☐	☐	☐	■
d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	☐	☐	■	☐

Applicable General Plan Policies, Ordinances, and Regulations

<u>City of Perris Ordinance Number 1051</u>

The City of Perris Ordinance 1051 requires (as codified in City of Perris Municipal Codes Sections 19.02.110 A and B, and 19.69.030.C.5.h) the use of certain types of light fixtures on non-residential properties. This requirement minimizes the amount of light cast on adjoining properties, the public right-of-way, and into the night sky.

<u>City of Perris General Plan Open Space Element</u>

Policy III.A Preserve the hillsides and rock outcroppings in the planning areas.

Explanation of Checklist Answers

Would the Project:

a) Have a substantial adverse effect on a scenic vista?

Less than Significant Impact. A scenic vista is generally defined as a public viewpoint that provides expansive or notable views of a highly valued landscape and are typically identified in planning documents, such as a general plan, but can also include locally known areas or locations where high-quality public views are available. The City of Perris General Plan does not identify the Project site as a scenic vista (City 2005). However, the General Plan considers large rocks to be a notable part of the City's landscape. The site is primarily undeveloped, with the exception of several trails, a BMX course, Owl Rock, and other man-made features (i.e., electrical transmission poles, etc.) (see Figure 4, *Site Photographs*). Physically, large rocks or boulders are sparsely scattered throughout the site. Presently the site also exhibits signs of illegal dumping, with debris such as mattresses and furniture, as well as trash piles scattered throughout the site creating an unpleasing aesthetic. Implementation of the proposed Project would enhance the visual quality of the site by incorporating a park into the space while preserving some of the site's most highly valued aspects of the natural landscape, such as riparian areas and some of the large rocks and boulders. The Project would also retain the BMX course and Owl Rock, which add to the site's visual character. The site would be regularly maintained by City staff, which would deter the type of illegal dumping and littering that currently occur at the site. Thus, the addition of the Enchanted Hill Park would not have a significant adverse effect on a scenic vista and would largely provide a beneficial effect compared to existing conditions. Impacts would be less than significant in relation to this issue.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

No Impact. State Route (SR) 74 as it passes through Perris is a designated State Scenic Highway. SR 74 at its closest distance is approximately 1.25 miles southeast of the Project site. The Ramona Expressway is identified as an eligible Scenic Highway between SR 76 in San Diego County and SR 91 in Riverside County. The nearest segment of the Ramona Expressway is approximately 3.5 miles northeast of the Project site. The Project site is not visible from either of these two roadways. Additionally, consistent with the General Plan Open Space Element Policy III.A, the City would retain many of the site's natural features including many of the groupings of large rocks and boulders that are dispersed throughout the site. Further, many of the trees and taller shrubbery that presently exist on the site are located in the riparian/riverine areas that are going to remain untouched by park development. Thus, given that site is not visible from either an officially designated or eligible State Scenic Highways and site design is considerate of retaining many of the site's natural features, the Project would have no impacts to scenic resources.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

c) In non-urbanized areas, substantially degrade the existing visual character or quality of public views of the site and its surroundings? (Public views are those that are experienced from publicly accessible vantage point). If the project is in an urbanized area, would the project conflict with applicable zoning and other regulations governing scenic quality?

No Impact. The Project site is located in a primarily residential area of the City of Perris and is zoned as R5 – Mobile home Subdivision and designated as R 6,000 (single-family residence, 6,000-square foot lot). The site is located in an area that currently supports a combination of single-family residential homes and undeveloped land near the western City boundary. Applicable regulations governing scenic quality include the City of Perris General Plan Open Space Element Policy III.A, to preserve hillsides and rock outcroppings. There are no specific zoning requirements in relation to scenic quality that are applicable to the proposed Project or Project area. As discussed in items I.a-b of this IS/MND, currently

PHOTO 1

Existing Conditions

PHOTO 2

Owl Rock

PHOTO 3

Scattered Debris Piles

PHOTO 4

Unoffical BMX Course

Site Photographs

Figure 4

the site is undeveloped but abandoned trash piles are located throughout the site, which would be removed with Project development. Moreover, other more amenable site features such as many of the large rocks and boulders, Owl Rock, and the riparian areas would remain. Thus, aesthetically, the Project would enhance the visual environment. Therefore, given that the Project does not conflict with any zoning or other regulations governing scenic quality and that the site would have improve the visual environment, the Project would have no impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Less than Significant Impact. There are two primary artificial sources of light that generally affect an urban environment: light emanating from building interiors that passes through windows to the outside, and light from exterior sources (e.g., street lighting, parking lot lighting, building illumination, security lighting, and landscape lighting) that affect the natural ambient light level. The introduction of light can be a nuisance by affecting adjacent areas and diminishing the view of the clear night sky depending on the location of the light sources and its proximity to nearby light-sensitive areas.

The Project site is located in an area that is developed with primarily residential uses. The existing light conditions in the Project area include streetlights and vehicle lights on the surrounding roadways and light emanating from the residential homes.

The Project would require a variety of lighting which would be a combination of pole and building mounted light features for the parking areas and the park, itself. Lighting would be included to illuminate walkways, the multi-use field, and other park amenities such as the restrooms. Site lighting would conform to the California Building Standards Code, Title 24, as well as the City's zoning code standards that regulate outdoor lighting. Specifically, the City's Ordinance No. 1051 requires the use of certain types of light fixtures on non-residential properties in an effort to minimize the amount of light cast on adjoining properties, the public right-of-way, and into the night sky. At times the multi-use field may be used during nighttime hours and lighting may be required especially during non-daylight-savings-time months. However, non-security lighting would only occur during the park hours of operation. During non-operational hours, the park would only support security lighting. Generally, parks close at 10 PM in the City of Perris.

Glare is generally associated with architectural features such as windows or mirrored and solar paneling. The Project does not include any structures that would have such features. The restroom building, which is the only permanent structure proposed at the park, would be constructed of standard building materials (i.e., non-reflective stucco siding, standing seam roofs), which would not create substantial daytime glare. Vehicles traveling to and from the site could be a source of daytime glare; however, the Project would not include a substantial number of cars visiting the Project site compared to the surrounding neighborhood (see Section XVII, Transportation of this IS/MND).

Therefore, since the Project would be subject to the lighting regulations set forth in City Ordinance 1051 and it does not include any reflective building materials or introduce a significant amount of vehicles into the Project area, impacts in relation to light and glare would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

II. AGRICULTURE AND FORESTRY RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	■
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	■
c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?	☐	☐	☐	■
d) Result in the loss of forest land or conversion of forest land to non-forest use?	☐	☐	☐	■
e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non- forest use?	☐	☐	☐	■

Applicable General Plan Policies, Ordinances, and Regulations

There are no agricultural-related General Plan policies, ordinances, or regulations that are applicable to the proposed Project.

Explanation of Checklist Answers

Would the Project:

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

No Impact. Agricultural land is rated according to soil quality and irrigation status; the best quality land is called Prime Farmland. Unique farmland is land, other than prime farmland, that has combined conditions to produce sustained high quality and high yields of specialty crops. Farmland of Statewide

Importance may include tracts of land that have been designated for agriculture by State law. In some areas that are not identified as having national or statewide importance, land is considered to be Farmland of Local Importance. The Farmland Mapping and Monitoring Program (FMMP) maintained by the California Department of Conservation (CDC) is the responsible state agency for overseeing the farmland classification.

While the largely undeveloped Project site would be converted to park land uses, the conversion would not include the loss of designated farmland. According to the FMMP online mapping database (CDC 2016), the Project site is classified as Urban and Built-Up Land (land that is developed with urban uses or less than 40 acres and surrounded by developed uses) and does not contain any Prime Farmland or Farmland of Statewide Importance. Additionally, the Conservation Element of the City of Perris General Plan does not identify the Project site as containing Prime Farmland, Unique Farmland, Farmland of Statewide Importance, Farmland of Local Importance, or Grazing Land (City 2005). Thus, the Project would have no impact in relation to this issue.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

No Impact. The Williamson Act, also known as the California Land Conservation Act of 1965, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use; in return, landowners receive property tax assessments which are much lower than normal because they are based upon farming and open space uses as opposed to full market value. The Williamson Act is only applicable to parcels within an established agricultural preserve consisting of at least 20 acres of Prime Farmland, or at least 40 acres of land not designated as Prime Farmland. The Williamson Act is designed to prevent the premature and unnecessary conversion of open space lands and agricultural areas to urban uses. As stated in item II.a, the Project site is located in an area classified by the CDC as Urban and Built-Up Land where neither farmland nor agricultural resources are present. The Project site is not zoned for agricultural use. Additionally, it is not within an established agricultural preserve consisting of at least 20 acres of Prime Farmland or at least 40 acres of land not designated as Prime Farmland. Further, the City of Perris General Plan Land Use Map classifies the land as Residential, and the Conservation Element of the General Plan does not map Williamson Act land within the Project site (City 2013; City 2005). Therefore, the Project would not conflict with existing zoning for agricultural use, or a Williamson Act contract. No impact would occur in relation to this issue.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

c) Conflict with existing zoning for, or cause rezoning of, forest land (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))?

No Impact. Public Resources Code Section 12220(g) defines “forest land” as land that can support 10 percent native cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits. Based on this definition, no forest land occurs within or adjacent to the Project site. Moreover, there is no land zoned as forest land or timberland that exists within the Project site or within its vicinity. There are scattered trees throughout the site; however, there are no concentration of trees within the site that would constitute a forest. Therefore, the proposed Project would not conflict with existing zoning for forest land or timberland, and no impact would occur in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

d) Result in the loss of forest land or conversion of forest land to non-forest use?

No Impact. As stated in item II.c, there is no concentration of trees on the site that would constitute a forest. The site has not been historically and is not currently used or planned to be used for forest land. As such, implementation of the proposed Project would not result in the loss of forest land or conversion of forest land to non-forest use. No impact would occur.

Mitigation Measure(s)

No mitigation measures are required.

e) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?

No Impact. As stated in items II.a-d, the Project site is located in an area classified as Urban and Built-Up Land, where neither farmland nor agricultural resources are present. Additionally, there is no concentration of trees that would constitute a forest. The site is encompassed by single-family housing and neighborhoods to the north, south, east, and west. Beyond the residential homes to the north is the Motte Rimrock Reserve, owned and operated by the University of California system. The proposed Project would result in the conversion of the undeveloped Project site to a City park to support the existing population in the Enchanted Hills area and the City at large. The Project would not result in conversion of farmland to non-agricultural use or conversion of forest land to non-forest use. Therefore, there would be no impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

III. AIR QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	■	☐
b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard?	☐	☐	■	☐
c) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	■	☐
d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?	☐	☐	■	☐

Applicable General Plan Policies, Ordinances, and Regulations

<u>City of Perris General Plan – Healthy Communities Element</u>

Policy H.6.3 Promote measures that will be effective in reducing emissions during construction activities:

- Perris will ensure that construction activities follow existing South Coast Air Quality Management District (SCAQMD) rules and regulations.
- All construction equipment for public and private projects will also comply with California Air Resources Board's (CARB) vehicle standards. For projects that may exceed daily construction emissions established by the SCAQMD, Best Available Control Measures will be incorporated to reduce construction emissions to below daily emission standards established by the SCAQMD.
- Project proponents will be required to prepare and implement a Construction Management Plan which will include Best Available Control Measures among others. Appropriate control measures will be determined on a project by project basis and should be specific to the pollutant for which the daily threshold is exceeded.

Explanation of Checklist Answers

The discussion below is based the Air Quality and Greenhouse Gas Emissions Technical Report prepared by HELIX Environmental Planning, Inc. (HELIX 2020a), attached to this IS/MND as Appendix A.

Would the Project:

a) Conflict with or obstruct implementation of the applicable air quality plan?

Less than Significant Impact. The Project site is located within Riverside County, whose regional planning agency is the Southern California Association of Governments (SCAG). With regards to air quality planning, SCAG has prepared the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), a long-range transportation plan that forecasts growth over a 20-year period to identify regional transportation strategies for future mobility needs. These growth forecasts form the basis for the land use and transportation control portions of the Air Quality Management Plan (AQMP). These documents are utilized in the preparation of the air quality forecasts and consistency analysis included in the AQMP. Both the RTP/SCS and AQMP are based, in part, on projections originating within County and City General Plans.

The two principal criteria for determining conformance to the AQMP are (1) whether the Project would result in an increase in the frequency or severity of existing air quality violations, cause or contribute to new violations, or delay timely attainment of air quality standards; and (2) whether the Project would exceed the assumptions in the AQMP.

With respect to the first criterion, the Project would not generate short-term or long-term emissions that could potentially cause an increase in the frequency or severity of existing air quality violations; cause or contribute to new violations; or delay timely attainment of air quality standards (HELIX 2020a). With respect to the second criterion, the Project site and surrounding areas have a land use designation of Single-Family Residential (R 6,000) in the City of Perris General Plan and are zoned as Mobile Home Subdivision (R5). The Project proposes a public park, which does not conflict with the Single-Family Residential land use designation or the Mobile Home Subdivision zoning. The Land Use Element of the City of Perris General Plan specifically states that the region, categorized as Planning Area 7: Westside Residential, is deficient in active parkland and sports fields for use by residents. As such, implementation of the proposed Project would align with the goals in the General Plan. In addition, as a public park in an existing neighborhood, the proposed Project would serve the existing population in the Enchanted Hills area and is not anticipated to generate population growth in the community. Based on these considerations, the Project would not obstruct implementation of the AQMP, and impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non- attainment under an applicable federal or state ambient air quality standard?

Less than Significant Impact. The Project would generate criteria pollutants and precursors in the short-term during construction and the long-term during operation. To determine whether the Project's emissions would result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment, or contribute substantially to a projected air quality violation, the Project's emissions are evaluated based on the quantitative emissions thresholds established by the SCAQMD.

The Project's criteria pollutant emissions were calculated using the California Emissions Estimator Model (CalEEMod) Version 2016.3.2. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and greenhouse gas (GHG) emissions associated with both construction and operations from a variety of land use projects. The model was developed for the California Air Pollution Control Officers Association (CAPCOA) in collaboration with the California air districts. CalEEMod allows for the use of default data (e.g., emission factors, trip lengths, meteorology, source inventory) provided by the various California air districts to account for local requirements and conditions, and/or user-defined inputs.

Construction Emissions

Construction of the Project would result in temporary increases in air pollutant emissions. These emissions would be generated in the form of fugitive dust emissions (PM_{10} and $PM_{2.5}$) and ozone precursor emissions (nitrogen oxides [NO_X] and reactive organic gas [ROG]). Construction emissions calculated using CalEEMod Version 2016.3.2 are provided in the Air Quality and Greenhouse Gas Emissions Technical Report prepared for the Project, included as Appendix A to this IS/MND (HELIX 2020a). The results of the calculations for Project construction are shown in Table 1, *Maximum Daily Construction Emissions*. The analysis assessed total annual emissions from site preparation, grading, building construction, paving, and architectural coating. The modeling assumes the application of water on all unpaved roads and disturbed surfaces a minimum of twice per day during site preparation and grading in compliance with SCAQMD Rule 403, Fugitive Dust.

Table 1
MAXIMUM DAILY CONSTRUCTION EMISSIONS

Phase	Pollutant Emissions (pounds/day)					
	ROG	NO_X	CO	SO_2	PM_{10}[1]	$PM_{2.5}$[1]
Site Preparation	4.2	42.5	22.1	<0.1	10.5	6.5
Grading	4.8	59.8	34.0	0.1	7.1	3.9
Building Construction	4.6	36.5	33.4	0.1	6.7	2.6
Paving	1.3	13.0	15.1	<0.1	0.8	0.7
Architectural Coating	0.6	1.8	4.2	<0.1	1.0	0.3
Maximum Daily Emissions	**4.8**	**59.8**	**34.0**	**0.1**	**10.5**	**6.5**
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Significant Impact?	***No***	***No***	***No***	***No***	***No***	***No***

Sources: CalEEMod, HELIX, 2020a

1 Estimated emissions account for application of water on all unpaved roads and disturbed surface two times per day, 12% soil moisture content, and on-site speed limit of 15 mph on unpaved surfaces.

ROG = reactive organic gas; NO_X = nitrogen oxides; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10}: respirable particulate matter 10 microns or less in diameter; $PM_{2.5}$: fine particulate matter 2.5 microns or less in diameter

As shown in Table 1, emissions of all criteria pollutants related to construction of the proposed park would be below the SCAQMD significance thresholds. Therefore, Project construction would not result in a short-term regional cumulatively considerable net increase of any criteria pollutant criteria pollutant emissions, and impacts would be less than significant in relation to this issue.

Operational Emissions

Long-term operational sources of pollutant emissions include area sources, energy, transportation, water use, and solid waste. Operational emissions from area sources include the use of consumer products and engine emissions from landscape maintenance equipment. Operational emissions from mobile sources are associated with Project-related vehicle trip generation and trip length. The Focused Traffic Assessment (Appendix F of this IS/MND) that was prepared for the Project estimated that the Project would generate 90 daily trips on weekdays and 450 daily trips on weekends (Urban Crossroads, Inc. 2019). CalEEMod defaults for trip purposes and distances were used, in addition to CalEEMod defaults for area sources, energy, water use, and solid waste sources. Table 2, *Maximum Daily Operational Emissions*, presents the summary of operational emissions for the Project.

Table 2
MAXIMUM DAILY OPERATIONAL EMISSIONS

Category	**Pollutant Emissions (pounds per day)[1]**					
	ROG	**NO_X**	**CO**	**SO_2**	**PM_{10}**	**$PM_{2.5}$**
Area	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Energy	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mobile	0.7	6.1	8.3	<0.1	2.8	0.8
Total Daily Emissions	**0.8**	**6.1**	**8.3**	**<0.1**	**2.8**	**0.8**
SCAQMD Thresholds	*55*	*55*	*550*	*150*	*150*	*55*
Significant Impact?	***No***	***No***	***No***	***No***	***No***	***No***

Source: CalEEMod (output data is provided in Appendix A)

1 Totals may not sum due to rounding.

ROG = reactive organic gas; NO_X = nitrogen oxides; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10}: respirable particulate matter 10 microns or less in diameter; $PM_{2.5}$: fine particulate matter 2.5 microns or less in diameter

As shown in Table 2, emissions of all criteria pollutants related to operation of the proposed park would be below the SCAQMD significance thresholds. Therefore, long-term Project operation would not result in a regional cumulatively considerable net increase of any criteria pollutant criteria pollutant emissions, and impacts would be less than significant in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

c) Expose sensitive receptors to substantial pollutant concentrations?

Less than Significant Impact. Sensitive populations (i.e., children, senior citizens, and acutely or chronically ill people) are more susceptible to the effects of air pollution than are the general population. Land uses that are considered sensitive receptors typically include residences, schools, playgrounds, childcare centers, hospitals, convalescent homes, and retirement homes. The closest existing sensitive receptors to the Project site are the single-family residences located adjacent to the Project site's eastern and western boundaries. An analysis of the Project's potential to expose sensitive receptors to pollutants during construction and operation is provided below.

Construction Activities

Criteria Pollutants

The localized effects from the on-site portion of daily construction emissions were evaluated at sensitive receptor locations potentially impacted by the Project according to the SCAQMD's localized significance threshold (LST) method, which is used to determine whether a Project may generate significant adverse localized air quality impacts. The LST method uses mass lookup tables that contain significance values created by SCAQMD staff (see Table 3, *Maximum Localized Daily Construction Emissions),* which are further categorized by sensitive receptor area (SRA). If a Project exceeds the LST look-up values, then the SCAQMD recommends that Project-specific localized air quality modeling be performed.

Table 3
MAXIMUM LOCALIZED DAILY CONSTRUCTION EMISSIONS

Phase	Pollutant Emissions (pounds/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Site Preparation	42.4	21.5	10.3	6.5
Grading	50.2	32.0	6.1	3.6
Building Construction	19.2	16.8	1.1	1.1
Paving	12.9	14.7	0.7	0.6
Architectural Coating	1.5	1.8	0.1	0.1
Maximum Daily Emissions	**50.2**	**32.0**	**10.3**	**6.5**
SCAQMD LST Thresholds	*270*	*1,577*	*13*	*8*
Significant Impact?	***No***	***No***	***No***	***No***

Source: CalEEMod (output data is provided in Appendix A); SCAQMD 2009
NO_X = nitrogen oxides; CO = carbon monoxide; PM_{10}: respirable particulate matter 10 microns or less in diameter; $PM_{2.5}$: fine particulate matter 2.5 microns or less in diameter

Consistent with the LST guidelines, when quantifying mass emissions for localized analysis, only emissions that occur on-site are considered. Emissions related to off-site delivery/haul truck activity and construction worker trips are not considered in the evaluation of construction-related localized impacts, as these do not contribute to emissions generated on a Project site. The LSTs being applied to the Project are based on source receptor area (SRA) 24, Perris Valley, receptors located within 25 meters, and a disturbed area of 5 acres. Table 3 presents the summary of the maximum localized daily construction emissions and compares them to the SCAQMD LST thresholds.

As shown in Table 3, localized emissions would not exceed the SCAQMD LSTs. Therefore, Project construction would not expose sensitive receptors to substantial criteria pollutant concentrations, and impacts would be less than significant.

Toxic Air Contaminants

Diesel particulate matter (DPM) is the primary toxic air contaminant (TAC) that would be emitted during construction and would be generated from the use of heavy equipment during earth-moving activities. Health-related risks associated with diesel-exhaust emissions are primarily linked to long-term exposure and the associated risk of contracting cancer. The amount to which the receptors could be exposed, which is a function of concentration and duration of exposure, is the primary factor used to determine health risk. The generation of TAC emissions during construction would be transitory and sporadic across the large site, and it is unlikely that heavy equipment would operate adjacent to any one receptor for an extended period of time. The entirety of construction would be short term in nature—lasting approximately 15 months, with the heaviest use of diesel equipment (during the site preparation and grading phases) lasting approximately 2 months. Current models and methodologies for conducting cancer health risk assessments are associated with longer-term exposure periods (typically 30 years for individual residents) and are best suited for evaluation of long duration TAC emissions with predictable schedules and locations. Due to the variable and sporadic nature of construction activity and the anticipated short construction schedule, TAC emissions from the Project's construction activity would not expose sensitive receptors to substantial pollutant concentrations. As such, Project-related TAC emission impacts during construction would not be significant and no mitigation is required.

<u>Operational Activities</u>

Carbon Monoxide Hotspots

A CO hotspot is an area of localized CO pollution that is caused by severe vehicle congestion on major roadways, typically near intersections. If a Project increases average delay at signalized intersections operating at Level of Service (LOS) E or F, or causes an intersection operating at LOS D or better without the Project to operate at LOS E or F with the Project, a quantitative screening is required. The Focused Traffic Assessment prepared for the proposed Project determined that due to the relatively low traffic volume (below 50 peak hour trips) associated with Project operations, analysis of potential off-site traffic impacts was not required (Urban Crossroads, Inc. 2019). As such, it can be concluded that Project-generated traffic would not increase the average delay at signalized intersections operating at LOS E of F or cause an intersection operating at LOS D or better without the Project to operate at LOS E or F with the Project. Therefore, the Project would not expose sensitive receptors to substantial pollutant concentrations as a result of CO hotspots, and impacts would be less than significant.

Toxic Air Contaminants

Long-term operation of the Project would result in some emissions of DPM from vehicles traveling to and from the Project site. However, the Project would not require the regular use of heavy or medium diesel-powered trucks (other than for occasional deliveries and waste collection). The mix of vehicles traveling to and from the Project site would primarily be gasoline-powered light duty automobiles and trucks, and do not result in emissions of DPM. Therefore, similar to construction activities, operationally the Project would not result in significant localized concentrations of DPM. As a recreational park, the proposed Project in not anticipated to generate other long-term operational TACs. Therefore, long-term operation of the Project would not result in the exposure of sensitive receptors to substantial pollutant concentrations, and impacts would be less than significant.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people?

Less than Significant Impact. The State of California Health and Safety Code Sections 41700 and 41705 prohibit emissions from any source whatsoever in such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to the public health or damage to property. The Project could produce odors during proposed construction activities resulting from construction equipment exhaust, application of asphalt, and/or the application of architectural coatings. However, odors emitted during construction would be temporary, short-term, and intermittent in nature, and the sources would be in different locations across the site as construction progresses. Further, these sources would cease upon the completion of the respective phase of construction.

CARB's Air Quality and Land Use Handbook includes a list of the most common sources of odor complaints received by local air districts. Typical sources of odor complaints include facilities such as sewage treatment plants, landfills, recycling facilities, petroleum refineries, and livestock operations (CARB 2005). The proposed Project would include a recreational park, which is not be anticipated to generate substantial odors. Therefore, the Project would not result in emissions leading to odors that would adversely affect a substantial number of people, and impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

IV. BIOLOGICAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?	☐	■	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Wildlife or US Fish and Wildlife Service?	☐	■	☐	☐
c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?	☐	☐	☐	■
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	■	☐
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	■

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
f)	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?	☐	☐	■	☐

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris Municipal Code Section 19.71.010

Section 19.71.010 of the City of Perris Municipal Code establishes the establishment and care for protected trees within the City's urban forest. Protected trees include public trees that are considered specimen or heritage trees that are defined within the code.

City of Perris General Plan Policy – Conservation Element

Policy II.A Comply with state and federal regulations to ensure protection and preservation of significant biological resources.

Implementation II.A.2: For public and private projects located in areas with potential for moderate or high plant and wildlife sensitivity, require biological surveys as part of the development review process.

Policy III.A Review all public and private development and construction projects and any other land use plans or activities within the Multiple Species Habitat Conservation Plan (MSHCP) area, in accordance with the conservation criteria procedures and mitigation requirements set forth in the MSHCP.

Explanation of Checklist Answers

The discussion below is based the Biological Resources Letter Report for the Enchanted Hills Park Project prepared by HELIX (2019a) and attached to this IS/MND as Appendix B.

Would the Project:

a) Would the Project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?

Less than Significant Impact with Mitigation Incorporated. A general biological survey of the Project site was conducted by HELIX on November 15, 2019, the findings of which are summarized in the Biological Resources Letter Report (Appendix B of this IS/MND). During the survey, a single special status plant species, paniculate tarplant, was observed. The Project site supports approximately 2,000 individuals of paniculate tarplant, of which approximately 88 percent would be affected by the

Project. However, the potentially affected particulate tarplant are isolated from surrounding populations, and therefore offer no long-term conservation value (HELIX 2019a). Additionally, this species is locally abundant within Riverside County and so the removal of the individual specimens within the Project site is not considered to be a threat to the continued existence of the species.

Additionally, a single special status wildlife species, Cooper's hawk, was observed during the survey. The Cooper's hawk, which is a covered species under the MSHCP may use the site for foraging and nesting. However, the design of the Project is considerate of preserving higher quality habitat by limiting Project features and land disturbance to habitats that are non-sensitive. Additionally, the Motte Rimrock Reserve, located 200 feet north of the study area, provides ample higher quality habitat for the Cooper's hawk. Therefore, it was determined the Project would not have a substantial adverse effect on the Cooper's hawk.

Although potential impacts to sensitive species identified on the Project site would be less than significant, the Project site contains some trees, shrubs, and other vegetation that provide potential nesting habitat for common birds, including birds and raptors protected under the Migratory Bird Treaty Act (MBTA) and California Fish and Game (CFG) Code. Construction of the proposed Project could occur during the general bird nesting season (January 15 through September 15) and, therefore, could result in impacts to nesting birds and violation of the MBTA and CFG Code. Direct impacts could occur as a result of removal of vegetation or soil supporting an active nest. Indirect impacts could occur as a result of construction noise, if they supported an active nest within nearby trees or rocky areas. Impacts would be considered significant if construction occurred within 300 feet of an active passerine nest or within 500 feet of an active raptor nest. Additionally, the Project area contains burrows that have the potential burrowing owl habitat (see Figure 7 of Appendix B of this IS/MND). As a result, there is the potential for significant impacts to nesting birds and burrowing owls, and mitigation is required.

Mitigation Measure(s)

MM BIO-1 **Pre-construction Nesting Bird Survey.** If initial grading and vegetation removal activities (i.e., earthwork, clearing, and grubbing) occurs during the general bird breeding season for migratory birds and raptors (January 15 through September 15), the Project applicant shall retain a qualified biologist to perform a pre-construction survey of potential nesting habitat to confirm the absence of active nests belonging to migratory birds and raptors afforded protection under the MBTA and CFG Code. The pre-construction survey shall be performed no more than seven days prior to the commencement of the activities. If the qualified biologist determines that no active migratory bird or raptor nests occur within 300 feet of the impact site (500 feet for raptors), the activities shall be allowed to proceed without any further requirements. If the qualified biologist determines that an active migratory bird or raptor nest is present, no impacts shall occur within the 300- to 500-foot avoidance buffer that will be established based on the species observed to be nesting. This buffer will remain until the young have fledged the nest and the nest is confirmed to no longer be active, or until noise barriers have been installed that adequately protect the nest, as determined by the qualified biologist.

MM BIO-2 **Pre-construction Burrowing Owl Survey.** A pre-construction burrowing owl survey shall be conducted in accordance with the protocol described in the Burrowing Owl Survey Instruction for the Western Riverside Multiple Species Habitat Conservation Plan Area

(Riverside County 2006). The initial take avoidance survey shall occur within 30 days prior to initiating ground disturbing activities. The Project shall avoid disturbing active burrowing owl burrows (active nests), and a buffer shall be established between construction activities and occupied burrows, at the discretion of the biologist. If an adequate avoidance buffer cannot be provided between an occupied burrow and required ground-disturbing activities, then passive relocation activities during the nonbreeding season (September 1 through February 29) shall be implemented in consultation with the California Department of Fish and Wildlife (CDFW). This would include preparation, approval, and implementation of a Burrowing Owl Exclusion Plan in accordance with protocol described in the CDFW Staff Report on Burrowing Owl Mitigation.

With implementation of mitigation measures MM BIO-1 and MM BIO-2, impacts related to nesting birds and burrowing owls would be less than significant.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by CDFW or U.S. Fish and Wildlife Service?

Less than Significant Impact with Mitigation Incorporated. Sensitive natural communities include land that supports unique vegetation communities or the habitats of rare or endangered species or subspecies of animals or plants as defined by Section 15380 of the CEQA Guidelines. The Project area supports multiple sensitive natural communities, including flat-topped buckwheat (disturbed) and non-native grassland. The Project area also contains potentially jurisdictional wetlands that include mule fat scrub and tamarisk scrub (see Figures 8, 9, and 10 of Appendix B, Biological Resources Letter Report of this IS/MND). Implementation of the Project would result in temporary and permanent impacts within two sensitive habitats (flat-topped buckwheat [disturbed] and non-native grassland), and there would be no direct impacts to sensitive riparian habitat. Table 4, *Impacts to Vegetation Communities*, summarizes the existing acreage and permanent Project impacts to these species.

Table 4
IMPACTS TO VEGETATION COMMUNITIES

Vegetation Community	Existing Acreage[1]	Permanent Impact[2]
Upland		
Flat-topped buckwheat (disturbed)	1.7	0.7
Non-native grassland	2.8	1.8
Disturbed	16.1	7.0
Developed	<0.1	0.0
Subtotal	20.7	**9.5**
Wetland/Riparian		
Mule fat scrub	1.44	0.00
Tamarisk scrub	0.67	0.00
Subtotal	2.11	**0.00**
TOTAL	**22.81**	**9.5**

[1] Upland habitats are rounded to the nearest 0.1 acre and wetland/riparian habitats are rounded to the nearest 0.01 acre. Total reflects rounding.
[2] Additional temporary impacts to upland habitat may result due to grading, access, and staging during construction.

The impact area for both construction and operation consist of the footprint of the park and associated infrastructure such as parking lots, restrooms, and play equipment as shown on Figure 3 of this IS/MND. There would be no impacts to potential wetlands as the Project has been designed to avoid these areas. The impact footprint includes the minor grading and laydown areas required for construction; thus, there would be no additional impacts beyond these areas. Impacts to flat-topped buckwheat (disturbed) and non-native grassland are covered by the MSHCP and no mitigation is required for those habitats because the Project site is located outside of a MSHCP Criteria Cell.

Potential significant indirect impacts could occur if stormwater runoff is not controlled at the construction site, and sediment, toxics, and/or other material are inadvertently carried into sensitive habitat within the mule fat scrub or tamarisk scrub east of the impact area. Furthermore, if the construction work areas are not properly fenced, inadvertent encroachment into adjacent sensitive riparian habitat could occur. As such, implementation of the proposed Project has the potential to result in significant impacts to sensitive habitats, and mitigation is required.

Mitigation Measure(s)

MM BIO-3 **Construction Fencing**. Temporary construction fencing (with silt barriers as needed according to the stormwater pollution prevention plan [SWPPP]) shall be installed at the limits of Project impacts (including construction staging areas and access routes) adjacent to sensitive habitat to prevent sensitive habitat impacts and to prevent the spread of silt from the construction zone into adjacent habitats. Temporary fencing shall be located on the eastern boundary of the impact area west of the mule fat and tamarisk scrub. Fencing shall be installed in a manner that does not impact habitats to be avoided.

A biological monitor shall be retained prior to the issuance of grading permits. The task of the monitor shall be to observe the initial ground-altering activities at the Project site in accordance with the mitigation measures set forth in this document. Construction crews shall limit their activities, vehicles, equipment, and construction materials to the fenced Project footprint. Equipment maintenance, staging, and dispensing of fuel, oil, coolant, or other such activities shall occur in designated areas within the fenced Project impact limits. These designated areas shall be located in previously compacted and disturbed areas to the maximum extent practicable in such a manner as to prevent runoff from entering adjacent habitat and shall be shown on the construction plans. Contractor equipment shall be checked for leaks prior to operation and repair, as necessary. “No-fueling zones” shall be designated on construction plans.

If work occurs beyond the fenced or demarcated limits of impact, work shall cease until the problem has been remedied to the satisfaction of the City. Impacts that occur to sensitive riparian areas beyond the approved fence shall be mitigated as determined by the City in coordination with the U.S. Fish and Wildlife Service (USFWS), U.S. Army Corps of Engineers (USACE), Regional Water Quality Control Board (RWQCB), and/or CDFW. Temporary construction fencing shall be removed upon Project completion.

With implementation of mitigation measure MM BIO-3, impacts related to sensitive natural communities would be less than significant.

c) Would the Project have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

No Impact. The proposed Project is designed to avoid all potentially jurisdictional wetlands on the site. Therefore, implementation of the proposed Project would not have a substantial adverse effect on state or federally protected wetlands. No impacts would occur in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

d) Would the Project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Less than Significant Impact. Wildlife corridors connect isolated habitat and allow movement or dispersal of plant materials and animals. Local wildlife corridors allow access to resources such as food, water, and shelter within the framework of the wildlife's daily routine and life history. Regional corridors provide these functions over a larger scale and link two or more large habitat areas, allowing the dispersal of organisms and the consequent mixing of genes between populations. A corridor is a specific route that is used for the movement and migration of species; it may be different from a linkage in that it represents a smaller or narrower avenue for movement. A linkage is an area of land that supports or contributes to the long-term movement of animals and genetic exchange by providing live-in habitat that connects to other habitat areas. Many linkages occur as stepping-stones that are made up of a fragmented archipelago arrangement of habitat over a linear distance. Important corridors and linkages have been identified on a local and regional scale throughout the MSHCP planning area. However, the Project site is isolated, surrounded by residential development and surface streets, and is not located within a designated core or linkage. Therefore, the site does not currently provide a wildlife corridor or linkage to the surrounding area. Additionally, there are no known wildlife nursery sites that occur on the Project site, and the proposed park will continue to provide open space for urban wildlife of similar quality as is provided in its current state. Project construction would be restricted to daytime hours and would not be expected to result in adverse indirect impacts on off-site habitat adjacent to the site. Construction work limits would be contained within temporary construction fencing in accordance with mitigation measure MM BIO-3. Therefore, impacts to wildlife movement and native nursery sites would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

No Impact. The City of Perris has a tree protection ordinance – Urban Forestry Establishment and Care (City of Perris Municipal Code Section 19.71.010) that is intended to preserve the urban tree canopy. Of particular concern are special status trees or trees and heritage trees, neither of which is present on the Project site. Additionally, the Project would retain many of the trees onsite that are located within the riparian areas. Additionally, the Project includes the planting of new trees as part of the overall landscape. There are no other local policies or ordinances that are applicable to the Project and thus, the proposed Project would have no impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

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

Less than Significant Impact. The Project occurs within the boundaries of the adopted MSHCP, within the Mead Valley Area Plan. Within the biological technical report (Appendix B), the proposed Project was evaluated for consistency with the following MSHCP issue areas: MSHCP Reserve Assembly requirements; Section 6.1.2 (Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools); Section 6.1.3 (Protection of Narrow Endemic Plant Species); Section 6.1.4 (Guidelines Pertaining to the Urban/Wildlands Interface); Section 6.3.2 (Additional Survey Needs and Procedures); and, Section 6.4 (Fuels Management). The Project is consistent with Section 6.1.2 because it does not impact Riparian/Riverine Areas, vernal pools, or species listed in Section 6.1.2. The Project is consistent with Section 6.1.3 because it does not impact narrow endemic plant species. The Project is consistent with Section 6.1.4 because is not within or adjacent to the MSHCP conservation area. The Project is consistent with Section 6.3.2 because the Project is not within a Criteria Area species survey area and because a burrowing owl habitat survey was conducted and determined that on-site conservation of burrowing owl habitat is not required, as detailed in Appendix B. Finally, the Project is consistent with Section 6.4 because the Project is not adjacent to MSHCP Conservation Area. Therefore, it was determined that that the proposed Project would be consistent with the MSHCP, and impacts would be less than significant.

Mitigation Measure(s)

No mitigation is required.

V. CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?	☐	☐	■	☐
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?	☐	■	☐	☐
c) Disturb any human remains, including those interred outside of dedicated cemeteries?	☐	■	☐	☐

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris General Plan – Conservation Element

Policy IV.A Comply with state and federal regulations and ensure preservation of the significant historical, archaeological and paleontological resources.

Explanation of Checklist Answers

The discussion below is based on the Cultural Resources Survey prepared by HELIX (2020b), which is included in Appendix C of this IS/MND.

Would the Project:

a) Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5?

Less than Significant Impact. The Cultural Resources Survey included a records search, Sacred Lands File search, Native American outreach, a review of historic aerial photographs and maps, and a pedestrian survey of the Project site. The records search was conducted at the Eastern Information Center (EIC) on November 12, 2019. The parameters of the records search were established by identifying the project site APNs and extending the record search to a one-mile radius from the Project site property lines. The search indicated that 15 previous cultural resources studies have been conducted within one mile of the Project area; however, no studies have occurred within the Project boundary (as determined by the APNs). Additionally, the records search results indicate that the previous cultural resource studies identified a total of 19 cultural resources within the one-mile radius. These resources consist of 12 prehistoric archaeological sites, one multi-component site containing a prehistoric component and a historic component, and six historic buildings and/or structures. The multi-component site is recorded as a prehistoric habitation site with milling features and a historic component consisting of an abandoned quarry, a foundation, and an earthen dam. The six historic resources are historic addresses that include five private residences and one building complex described as the Palomar Military Academy, and then subsequently as the Perris Ranch.

The field investigation included as part of the Cultural Resources Survey was completed by HELIX archaeologists and a Native American monitor on November 25, 2019. The field survey did No cultural resources were identified within the Project area during the field survey. Based on the results of the records search and field survey, it is unlikely that implementation of the Project would cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5. As a result, impacts to historical resources would be less than significant in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

Less than Significant Impact with Mitigation Incorporated. As stated above, 12 prehistoric archaeological sites and one multi-component site containing a prehistoric and a historic component, have been recorded within one mile of the Project site. The EIC records search indicated that no previous searches were conducted at the site and there was no available information pertaining to archeological resources on the site. Thus, as discussed above in item I.a, HELIX staff and a Native American monitor conducted a field survey in November 2019 in an effort to identify any cultural resources. The field survey did not result in the identification of any archaeological resources within the Project area. Yet, the general vicinity of the Project has been occupied/used by the Luiseño, Cahuilla, and other native people for thousands of years, so there is the potential for unknown buried cultural remains/resources to be present within the Project site boundaries, which may be affected during ground-disturbing activities. Therefore, there is potential for the Project to cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5 of the CEQA Guidelines, and mitigation is required.

Mitigation Measure(s)

MM CUL-1 **Cultural Resource Monitoring During Construction.** A professional archaeologist shall be retained prior to the issuance of grading permits. The task of the archaeologist shall be to monitor the initial ground-altering activities at the subject site for the unearthing of previously unknown archaeological and/or cultural resources. Selection of the archaeologist shall be subject to the approval of the City of Perris Director of Development Services and no grading activities shall occur at the site until the archaeologist has been approved by the City. The archaeological monitor shall be responsible for maintaining daily field notes and a photographic record, and for reporting all finds to the City of Perris in a timely manner. The archaeologist shall be equipped to record and salvage cultural resources that may be unearthed during grading activities. The archaeologist shall be empowered to temporarily halt or divert grading equipment to allow recording and removal of the unearthed resources.

In the event that archaeological resources are discovered at the Project site, the handling of the discovered resources will differ in accordance with the find. However, it is understood that all artifacts with the exception of human remains and related grave goods or sacred/ceremonial objects belong to the property owner (City). All artifacts discovered at the development site shall be inventoried and analyzed by the professional archaeologist.

If any artifacts of Native American origin are discovered, all activities in the immediate vicinity of the find (within a 50-foot radius) shall stop and the Project archaeologist shall notify the City of Perris Planning Division, the Pechanga Band of Luiseño Indians, the Soboba Band of Luiseño Indians, and any other tribes identified by the California Native American Heritage Commission (NAHC) known as being affiliated with the area. A designated Native American observer from one of the tribes identified by the NAHC as being affiliated with the area shall be retained to help analyze the Native American artifacts for identification as everyday life and/or religious or sacred items, cultural affiliation, temporal placement, and function, as deemed possible. The significance of Native American resources shall be evaluated in accordance with the provisions of CEQA and shall consider the religious beliefs, customs, and practices of the Luiseño tribes. All items found in association with Native American human remains shall be considered grave goods or sacred in origin and subject to special handling.

In the event that Native American artifacts are relocated/reburied at the Project site the City shall enter into a fully executed relocation/reburial agreement with the assisting Native American tribes or bands. This shall include measures and provisions to protect the reburial area from any future impacts. Relocation/reburial shall not occur until all cataloging and basic recordation have been completed. Native American artifacts that cannot be avoided or relocated at the Project site shall be prepared in a manner for curation at an accredited curation facility in Riverside County that meets federal standards per 36 CFR Part 79 and makes the artifacts available to other archaeologists/ researchers for further study such as University of California, Riverside Archaeological Research Unit (UCR-ARU) or the Western Center for Archaeology and Paleontology. If more than one Native American group is involved with the Project and they cannot come to an agreement as to the disposition of Native American artifacts, they shall be curated at the Western Center by default. The archaeological consultant shall deliver the Native American artifacts, including title, to the accredited curation facility within a reasonable amount of time along with the fees necessary for permanent curation.

Non-Native American artifacts shall be inventoried, assessed, and analyzed for cultural affiliation, personal affiliation (prior ownership), function, and temporal placement. Subsequent to analysis and reporting, these artifacts will be subjected to curation or returned to the City, as deemed appropriate.

Once grading activities have ceased or the archaeologist, in consultation with the designated Native American observer, determines that monitoring is no longer necessary, monitoring activities can be discontinued following notification to the City of Perris Planning Division. A report of findings, including an itemized inventory of recovered artifacts, shall be prepared upon completion of the steps outlined above. The report shall include a discussion of the significance of all recovered artifacts. The report shall provide evidence that any Native American and Non-Native American archaeological resources recovered during Project development have been avoided, reburied, or curated at an accredited curation facility. A copy of the report shall also be filed with the EIC and submitted to the Pechanga Band of Luiseño Indians, the Soboba Band of Luiseño Indians, and any other Native American groups involved with the Project.

With implementation of mitigation measure MM CUL-1, impacts would be less than significant.

c) Disturb any human remains, including those interred outside of dedicated cemeteries?

Less than Significant Impact with Mitigation Incorporated. The Project site is not located within or near a formal cemetery and is not known to be located on a burial ground. However, as stated above, the general vicinity of the Project site has been occupied/used by the Luiseño, Cahuilla, and other native people for thousands of years, so there is the potential for, yet unknown buried human remains to be present within the Project area. Should human remains be uncovered during construction, compliance with existing regulations (State Health and Safety Code Section 7050.5) would be required. As a result, the ground-disturbing activities associated with the Project have the potential to disturb human remains, and mitigation is required.

Mitigation Measure(s)

MM CUL-2 **Protocol for Unintentional Disturbance of Human Remains.** In the event that human remains (or remains that may be human) are discovered at the Project site during grading or earthmoving, the construction contractors, Project archaeologist, and/or designated Native American observer shall immediately stop all activities within 100 feet of the find. The City shall then inform the Riverside County Coroner and the City of Perris Planning Division immediately, and the coroner shall be permitted to examine the remains as required by California Health and Safety Code Section 7050.5(b).

If the coroner determines that the remains are of Native American origin, the coroner shall notify the NAHC, which will identify the Most Likely Descendent (MLD). Despite the affiliation with any Native American representatives at the site, the NAHC's identification of the MLD shall stand. The MLD shall be granted access to inspect the site of the discovery of Native American human remains and may recommend to the City means for treatment or disposition, with appropriate dignity of the human remains and any associated grave goods. The MLD shall complete his or her inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. The disposition of the remains shall be determined in consultation between the City and the MLD. In the event that the City and the MLD are in disagreement regarding the disposition of the remains, State law shall apply, and the median and decision process shall occur with the NAHC (see Public Resources Code Section 5097.98(e) and 5097.94(k)).

The specific locations of Native American burials and reburials will be proprietary and not disclosed to the general public. The locations will be documented by the consulting archaeologist in conjunction with the various stakeholders and a report of findings will be filed with the EIC. If the human remains are determined to be other than Native American in origin, but still of archaeological value, the remains will be recovered for analysis and subject to curation or reburial at the expense of the Project proponent. If deemed appropriate, the remains will be recovered by the Coroner and handled through the Coroner's Office. Coordination with the Coroner's Office would be through the City of Perris and in consultation with the various stakeholders.

With implementation of mitigation measure MM CUL-2, impacts would be less than significant.

VI. ENERGY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?	☐	☐	■	☐
b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?	☐	☐	■	☐

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris General Plan Conservation Element

Policy VIII.B Adopt and maintain development regulations that encourage recycling and reduced waste generation by construction projects.

Explanation of Checklist Answers

Would the Project:

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction or operation?

Less than Significant Impact. The construction and operation of the proposed Project would involve the consumption of energy. A primary source of energy consumption is from vehicle trips; however, as discussed throughout this document, the proposed Project is intended to serve the existing population in an area that is currently park deficient. Thus, there is the potential that with a local park, the existing residents will not need to travel as far or use vehicular transportation to use the proposed park facilities, thereby reducing overall area-wide vehicle trips. Additionally, new development typically consumes energy in the forms of electricity and natural gas. The proposed Project entails the construction of a park that includes a multi-use field, child play area, toddler play area, restrooms, picnic shelters, hardscape, parking lots, bridges, trails, a basketball court, BMX course improvements, art rocks, a splash pad, a skating area, and a zip line. The proposed Project may use energy for lighting within the park; however, with the advancements in fuel efficiency technologies and compliance with California Code of Regulations (CCR) Title 24, there are opportunities for the proposed Project to incorporate energy efficiency. As such, implementation of the Project would not result in a potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy sources. Impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

b) Conflict with or obstruct a state or local plan for renewable energy or energy efficiency?

Less than Significant Impact. The City of Perris approved the City's Climate Action Plan (CAP) in February 2016, which provides the framework for reducing the City's GHG emissions and consequently improving energy efficiency. Often local energy conservation plans and goals, such as those in the City's CAP are devised based upon the anticipated land uses within a planning area as outlined in planning documents including a City's General Plan or Zoning Ordinance. As discussed, the Project site is zoned as R5 – Mobile Home Subdivision and has a General Plan land use designation of R 6,000 (Single-Family Residential 6,000-square foot lot).

A public park like the one proposed would consume less energy than the residential land uses. Specifically, the Project site land use designation would allow for up to 159 homes to be constructed on the site, which would demand energy on a continual basis for heating and cooling, cooking, lighting, electronics, etc. Alternatively, the Project would retain portions of the site in its natural state and any additional landscaping would be drought tolerant. As is typical of other public water play areas, water usage at the splash pad would be activated by the users and only be active during the time of use. All lighting would be energy efficient as required by CCR Title 24. Unlike a residential home, the park would not have a continual demand for energy. Energy would largely be confined to the nighttime hours from security lighting. Regular maintenance may require energy; however, this would not be a daily occurrence. For comparative purposes, using modeling defaults for energy usage in the CalEEMod program, residential land uses would consume 2,286,870 kilowatt British thermal unit per year (kbtu/yr) of natural gas and 789,790 kilowatt per year (kW/yr) of electricity while energy usage for a proposed park uses (as described in Section VIII, Greenhouse Gas Emissions, of this IS/MND) would be negligible (CalEEmod 2020). Thus, while park usage would consume energy, it would be much less than other allowed development land uses on the site. Therefore, the energy use would be within the parameters of local plans and goals set forth in the CAP and would not conflict or obstruct the City's ability to meet its identified goals.

Furthermore, several levels of government have implemented regulatory programs in response to reducing GHG emissions, which consequently serve to increase energy efficiency. Several State agencies, including CARB, California Energy Commission, California Public Utilities Commission, CalRecycle, California Department of Transportation (Caltrans), the Department of Water Resources, have developed regulatory and incentive programs that promote energy efficiency. Many of the measures are generally beyond the ability of any future development to implement and are implemented at the utility provider or the manufacturer level.

The proposed Project is a park that is intended to serve an existing population and once operational, would have a relatively low demand for energy resources. However, compliance with CCR Title 24, Part 11 as required would further assure energy efficiency. Title 24 regulates green building practices and includes standards for planning and design, water efficiency, material conservation and resource efficiency, and environmental quality. Regulations for non-residential development set forth the standards for bicycle parking, light pollution reduction, electric vehicle charging spaces, low flow faucets, and toilets, irrigation, and weather protection; all with the goal of increasing energy efficiency.

Given that the Project would have a low long-term rate of energy consumption, especially in comparison to other allowable land uses at the Project site and that the Project would be designed to adhere to the requirements of Title 24, the Project would have a less than significant impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

VII. GEOLOGY AND SOILS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	☐	☐	☐	■
ii. Strong seismic ground shaking?	☐	☐	■	☐
iii. Seismic-related ground failure, including liquefaction?	☐	☐	■	☐
iv. Landslides?	☐	☐	☐	■
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	■	☐
c) 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?	☐	☐	■	☐
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?	☐	☐	☐	■
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of waste water?	☐	☐	☐	■
f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	☐	☐	■	☐

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris Municipal Code Section 16.08.050

Current law states that every local agency enforcing building regulations, such as cities and counties, must adopt the provisions of the California Building Code (CBC) within 180 days of its publication. Section 16.08.050 of the City of Perris Municipal Code adopts and codifies the CBC. The CBC specifies the conditions in which a geological investigation shall be conducted and establishes the minimum mandatory requirements for development under certain geological conditions.

City of Perris General Plan Safety Element

Policy I.E All development will be required to include adequate protection from damage due to seismic incidents.

City of Perris General Plan Conservation Element

Policy IV.A Comply with state and federal regulations and ensure preservation of the significant historical, archaeological and paleontological resources.

Explanation of Checklist Answers

Would the Project:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

  i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42?

No Impact. Seismically induced surface or ground rupture occurs when movement on a fault deep within the earth breaks through to the surface as a result of seismic activity. Fault rupture almost always follows pre-existing faults, which are zones of weakness. Sudden displacements are more damaging to structures because they are accompanied by shaking. Under the Alquist-Priolo Earthquake Fault Zoning Act, the California State Geologist identifies areas in the State that are at risk from surface fault rupture. The Alquist Priolo Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. That requires the State Geologist to establish regulatory zones, known as Alquist-Priolo Earthquake Fault Zones, around the surface traces of active faults and to issue appropriate maps that identify these zones.

The Project site is not in the vicinity of an earthquake fault and is not affected by a state-designated Alquist Priolo Earthquake Fault Zone (City 2005). Therefore, Project implementation would not expose people or structures to potential substantial adverse effects involving rupture of a known earthquake fault. No impact would occur in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

  ii. Strong seismic ground shaking?

Less than Significant Impact. There are no known active faults that cross the Project site, but there are several active faults that run throughout the region. The Elsinore Fault is approximately 9.5 miles southwest of the Project site. Additionally, the San Jacinto Fault Zone is approximately 10.5 miles northeast of the Project site. The Project site is within a seismically active area and, therefore, can be subject to strong seismic ground motion. The Project would comply with the seismic design parameters outlined in the CBC, which provide requirements for earthquake safety based on factors such as occupancy type, the types of soils onsite, and the probable strength of ground motion (City 2005). Compliance with construction and building safety standards would be required prior to building permit approval, which would reduce potential impacts associated with strong seismic ground shaking at the Project site to a less than significant level.

Mitigation Measure(s)

No mitigation measures are required.

iii. Seismic-related ground failure, including liquefaction?

Less than Significant Impact. Areas containing alluvium soil deposits are often susceptible to seismically induced liquefaction. According to the City of Perris General Plan, the Perris Valley comprises extensive alluvial deposits resulting from erosion of sediments from the San Jacinto Mountain Range (City 2005). Therefore, the central and northeastern portions of Perris, are considered susceptible to moderate to very high liquefaction potential. Additionally, the City of Perris General Plan Safety Element, Exhibit S-3, Liquefaction Hazards, identifies the site to be within an area of no groundwater data/moderate potential for liquefaction (City 2005). As such, the potential for liquefaction exists in the event of a large earthquake with a high acceleration of seismic shaking. The proposed Project includes no habitable structures, which would permanently place people in an area of unknown or moderate potential for liquefaction. Additionally, the Project construction would comply with the latest standards of the CBC to assure safe construction. Compliance with the CBC would reduce adverse effects involving seismic related ground failure, including liquefaction, to less than significant levels.

Mitigation Measure(s)

No mitigation measures are required.

iv. Landslides?

No Impact. According to the Safety Element of the City of Perris General Plan, the Project site is not located within an area with high susceptibility to seismically induced landslides and rockfalls (City 2005). As such, there would be no impacts related to landslides.

Mitigation Measure(s)

No mitigation measures are required.

b) Result in substantial soil erosion or the loss of topsoil?

Less than Significant Impact. Soil exposed by construction activities could be subject to erosion if exposed to heavy rain, winds, or other storm events. There is the potential for soil erosion or loss of topsoil during construction activities as the ground is cleared and graded; however the required compliance with the National Pollution Discharge Elimination System General Construction Permit, the SWPPP, and Water Quality Management Plan (WQMP) (see Section X, Hydrology and Water Quality), reduces construction related erosion impacts. Additionally, as discussed in Section IV, Biology, MM BIO-3, Construction Fencing, provides further protection from erosion. Further, the CBC requires an erosion control and grading plans prior to issuance of a grading permit as a means to mitigate soil erosion to the extent practicable during both construction and operational phases (City 2005). Once operational, the Project site would include some impervious or semi-impervious features, that if not designed properly could allow for stormwater to sheet flow and consequently erode soils. However, the preparation of a WQMP would require that the City demonstrate how stormwater flows will be managed so as to not carry soils and sediments. The City engineer is required to approve the WQMP (as well as the SWPPP) prior to the issuance of grading permits. Additionally, other features such as a detention basin and the turfed multi-use field would capture storm flows that could otherwise be directed and erode loose soils across the site. Therefore, the required compliance with the various permits and plans would reduce Project impacts to less than significant in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

c) 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?

Less than Significant Impact. The Project site is not located within an area that is subject to landslides, and so impacts related to landslides would not occur (City 2005). As stated in item VII.a.iii, the Project area is located in an area that may potentially experience hazards related to liquefaction, and so it could be subject to liquefaction and lateral spreading. Similarly, Perris Valley is susceptible to subsidence in various portions throughout the region. However, impacts related to liquefaction, lateral spreading, or subsidence would not be significant because the proposed Project would comply with the CBC building safety design standards. The proposed Project would not be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and any impacts related to landslide, lateral spreading, subsidence, liquefication, or collapse would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial direct or indirect risks to life or property?

No Impact. Expansive soils are prone to large volume changes, usually associated with clay, they expand when there is a high-water content and shrink when the water evaporates or is dried out (swelling and shrinking). Expansive soil is generally a concern when designing building foundations and the installation of underground infrastructure.

Soil series mapped for the Project area include the Cieneba and Hanford soil series (Natural Resources Conservation Service [NRCS] 2019). In the rocky hill areas on the western and eastern sides of the project site, the soil type is Cieneba rocky sandy loam. Through the central area of the property the soil type is Hanford coarse sandy loam (NRCS 2019). Neither of these soil series typically contain the characteristics to create expansiveness. In addition, with the exception of the restroom facilities, the Project does not include any permanent building structures. Any undergrounding of infrastructure would be to establish local connections for electric, water, and sewer service and would not require deep excavations. Therefore, given all of these factors, the Project would have no impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No Impact. The proposed Project does not include the installation of septic tanks or alternative waste wastewater systems. The Project includes facilities that would require localized connections to the existing local sewer system infrastructure in the Project area for the proposed restrooms. No impacts would occur in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

f) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

Less than Significant Impact. Paleo Solutions prepared a Paleontological Technical Report for the proposed Project. The Project site was evaluated for paleontological sensitivity based upon existing data. Paleontological sensitivity assignments were developed following the Potential Fossil Yield Classification (PFYC) system (Bureau of Land Management [BLM] 2016) and best practices in mitigation paleontology (Murphey et al. 2019). The evaluation concluded that due to the soil types and geological composition at the site, the Project site as a very low potential to support paleontological resources. No further investigation or mitigation is recommended. Further, the City of Perris General Plan Conservation Element (City 2005), Exhibit CN-7, Paleontological Sensitivity, does not identify the Project site as being within a paleontologically sensitive area. The site is identified as within Zone 3, Low Sensitivity. Thus, the Project is considered to have a less than significant impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

VIII. GREENHOUSE GAS EMISSIONS

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	☐	☐	■	☐

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?	☐	☐	■	☐

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris Climate Action Plan

The City of Perris adopted the City's CAP on February 23, 2016. The City's CAP serves as a long-range comprehensive plan for reducing GHG emissions that is consistent with Assembly Bill (AB) 32 and implements the goals and policies of the Perris General Plan. The City's CAP builds upon the Western Riverside Council of Government's Subregional CAP in order to reduce GHG emissions by 2020 and beyond, to be achieved through the efforts of federal, state, and regional programs, and in addition, will implement additional local measures within the community.

City of Perris General Plan Conservation Element

Policy X.B Encourage the use of trees within project design to lessen energy needs, reduce the urban heat island effect, and improve air quality throughout the region.

Policy XI.A The City shall support LEED development standards and gray water usage for all new and refurbished public buildings and facilities. All projects undertaken by the City, or that receive funding from the City, or the Redevelopment Agency should be encouraged to utilize green building practices.

Policy XI.B The City shall actively reduce GHG emissions from public facilities throughout the community.

Explanation of Checklist Answers

The discussion below is based on the Air Quality and Greenhouse Gas Emissions Technical Report prepared by HELIX (2020a), attached to this IS/MND as Appendix A.

Would the Project:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment?

Less than Significant Impact. GHGs are emitted by natural processes and human activities primarily associated with: (1) the burning of fossil fuels during motorized transport, electricity generation, natural gas consumption, industrial activity, manufacturing, and other activities; (2) deforestation; (3) agricultural activity; and (4) solid waste decomposition. Emissions of GHGs in excess of natural ambient concentrations are thought to be responsible for the enhancement of the GHG effect and contributing to what is termed "global warming," the trend of warming of the earth's climate from anthropogenic activities. Global climate change impacts are by nature cumulative; direct impacts cannot be evaluated because the impacts themselves are global rather than localized impacts.

The GHGs defined under California's AB 32 include carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). As individual GHGs have varying heat-trapping properties and atmospheric lifetimes, GHG emissions are converted to carbon dioxide equivalent (CO_2e) units for comparison. The CO_2e is a consistent methodology for comparing GHG emissions because it normalizes various GHG emissions to a consistent measure.

There are no established federal, state, or local quantitative thresholds applicable to the Project to determine the quantity of GHG emissions that may have a significant effect on the environment. CARB, the SCAQMD, and various cities and agencies have proposed, or adopted on an interim basis, thresholds of significance that require the implementation of GHG emission reduction measures. For the proposed Project, the most appropriate screening threshold for determining GHG emissions is the SCAQMD proposed Tier 3 screening threshold of 3,000 MT CO_2e per year (SCAQMD 2010). The SCAQMD's Tier 3 screening threshold was developed to meet the year 2020 statewide GHG emissions targets as mandated by AB 32 and implemented by the CARB Scoping Plan. The SCAQMD has not proposed revised thresholds to account for GHG reduction targets beyond 2020. Accordingly, a threshold reduced by 4.98 percent for each year between 2020 and 2030 would meet the mandates of SB 32. The first full year of operation for the project is anticipated to be 2022. Therefore, a threshold of 2,709 MT CO_2e per year is used in this analysis.

The Project would result in emissions of GHGs during both construction and operation. GHG emissions resulting from Project construction and operation are analyzed below.

Construction Emissions

Construction sources of GHG emissions include heavy construction equipment, worker vehicle miles, and water use. The Project's construction GHG emissions were estimated using CalEEMod Version 2016.3.2 and are shown in Table 5, *Estimated Construction GHG Emissions*. Emissions of GHGs related to the construction of the Project would be temporary, and the total estimated GHG emissions associated with construction of the Project would be 1,361.8 MT CO_2e. To be conservative in accounting for all Project sources of GHG emissions, the construction period GHG emissions were amortized (i.e., averaged) over 30 years to be added to operational emissions. Averaged over 30 years, the proposed construction activities would contribute approximately 45.4 MT CO_2e emissions per year.

Table 5
ESTIMATED CONSTRUCTION GHG EMISSIONS

Year	Emissions (MT CO_2e)
2020	380.6
2021	981.2
Total	**1,361.8**
Amortized Construction Emissions	*45.4*

Source: HELIX 2020a, CalEEMod (output data is provided in Appendix A).
[1] Construction emissions amortized over 30 years.
MT = metric tons; CO_2e = carbon dioxide equivalent

Operational Emissions

During operations, sources of GHG emissions would include area sources (landscaping equipment), energy use, vehicular use, solid waste generation, and water conveyance and treatment. The Project's operational GHG emissions were estimated using CalEEMod Version 2016.3.2 and are shown in Table 6, *Estimated Annual Operational GHG Emissions*. As shown in Table 6, the total estimated GHG emissions associated with operation of the Project would be 340.4 MT CO_2e. As stated above, the construction period GHG emissions were amortized over 30 years to be added to operational emissions. Averaged over 30 years, the proposed construction activities would contribute approximately 45.4 MT CO_2e emissions per year. Combined with operational emissions, there would be a total of 385.8 MT CO_2e emissions per year.

Table 6
ESTIMATED ANNUAL OPERATIONAL GHG EMISSIONS

Emission Sources	Emissions (MT CO_2e per year)
	2021
Area Sources	<0.1
Energy Sources	<0.1
Vehicular (Mobile) Sources	265.2
Solid Waste Sources	0.7
Water Sources	74.5
Operational Subtotal	*340.4*
Construction (Annualized over 30 years)	45.4
Total Emissions[1]	**385.8**
SCAQMD	2,709
Exceed Threshold	***No***

Source: HELIX 2020a, CalEEMod output data is provided in Appendix A
[1] Totals may not sum due to rounding.
MT = metric tons; CO_2e = carbon dioxide equivalent

The total yearly GHG emissions for the Project would total approximately 385.8 MT CO_2e, which is well below the SCAQMD adjusted threshold of 2,709 MT CO_2e per year. Therefore, the proposed Project would not generate excessive GHG emissions, and impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

b) Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of greenhouse gases?

Less than Significant Impact. There are numerous State plans, policies, and regulations adopted for the purpose of reducing GHG emissions. The principal overall State plan and policy is AB 32. The quantitative goal of AB 32 is to reduce GHG emissions to 1990 levels by 2020. Senate Bill (SB) 32 requires further reductions of 40 percent below 1990 levels by 2030. Because the Project would become operational after 2020, the Project aims to reach the quantitative goals set by SB 32. As shown in Table 6, the Project's emissions would be well below the SCAQMD threshold adjusted for compliance with SB 32. Statewide plans and regulations such as GHG emissions standards for vehicles (AB 1493), the Low Carbon Fuel Standard (LCFS), and regulations requiring an increasing fraction of electricity to be generated from renewable sources are being implemented at the statewide level; as such, compliance at the Project level is not addressed. Therefore, the proposed Project does not conflict with those plans and regulations.

As stated above, the increase in GHG emissions would be less than the significance threshold being applied to this analysis. In addition, the trails provided would be consistent with the City's CAP Measure T-1, Bicycle Infrastructure Improvements, and by providing a recreational use in proximity to existing residences, the Project would be consistent with Measure T-7, Mixed-Use Development. Implementation of the proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, and impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

IX. HAZARDS AND HAZARDOUS MATERIALS

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a)	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	☐	☐	■	☐
b)	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?	☐	☐	■	☐
c)	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?	☐	☐	☐	■
d)	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	■
e)	For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?	☐	☐	■	☐
f)	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	☐	☐	■	☐

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
g)	Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?	☐	☐	■	☐

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris Municipal Code Section 10.12.100

Section 10.12.100, Detours and Construction, of the city of Perris Municipal Codes identifies that no street shall be closed or partially obstructed, or detours established, without approval of the City's traffic engineer.

City of Perris General Plan Safety Element

Policy I.D Consult the AICUZ Land Use Compatibility Guidelines and the ALUP Airport Influence Area development restrictions when considering development project applications.

Policy I.F The City will cooperate with the County of Riverside and the Riverside County Fire Department to enforce all rules related to Hazardous Materials generators and handlers.

Policy II.A The city shall require roadway improvements to expedite quick and safe travel by emergency responders.

Explanation of Checklist Answers

Would the Project:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Less than Significant Impact. Materials and waste are generally considered hazardous if they are poisonous (toxicity), can be ignited by open flame (ignitability), corrode other materials (corrosivity), or react violently, explode or generate vapors when mixed with water (reactivity). The term "hazardous material" is defined in the State Health and Safety Code (Chapter 6.95, Section 25501[o]) as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment. Hazardous waste is defined as any hazardous material that is abandoned, discarded, or recycled, as defined in the State Health and Safety Code (Chapter 6.95, Section 25125). The transportation, use, and disposal of hazardous materials, as well as the potential releases of hazardous materials to the environment, are closely regulated through many state and federal laws.

Construction activities associated with the proposed Project would require transportation and use of limited quantities of fuel, oil, sealants, and other hazardous materials related to construction. The use of hazardous materials and substances during construction would be subject to federal, state, and local health and safety requirements for handling, storage, and disposal. As a result, hazardous material impacts related to construction activities would be less than significant. Typically, day to day activities at the park would not involve the routine transport, use, or disposal of hazardous materials. Potentially, regular maintenance such as janitorial activities or field and landscape care could use cleaning products or herbicides and pesticides. No special permits would be required for such limited transport, use and/or disposal of these common products. Impacts would be less than significant in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Less than Significant Impact. As with most construction, there is the possibility of accidental release of hazardous substances during typical construction activities. Specifically, site development would involve a range of activities that would include the use of common hazardous materials, substances, or chemicals such as fuels, oils, lubricants, paints, and solvents. Construction activities would be short-term, and the use of these materials would cease once construction is complete. The hazardous substances used during construction would be required to comply with existing federal, state and local regulations regarding the use and disposal of these materials. In the event of an accidental release during construction containment and clean up would be in accordance with existing applicable regulatory requirements.

Project operation would involve the routine transport, use, or disposal of hazardous materials. Regular maintenance such as janitorial activities or field and landscape care could use cleaning products or herbicides and pesticides. No special permits would be required for use and/or disposal of these common products, and any accidental release of these materials would not create a significant hazard to the public or the environment. Therefore, impacts would be less than significant in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

No Impact. The proposed site for the Enchanted Hills Park is not located within one-quarter mile of an existing or proposed school. The nearest school is the Enchanted Hill Elementary School, which is approximately 0.4 mile south of the site. Therefore, the Project would not emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. Additionally, as discussed in items IX.a-b, the proposed park uses do not involve regular handling of hazardous or acutely hazardous materials. No impact would occur in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

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

No Impact. Government Code 65962.5 stipulates that the Department of Toxic Substances Control (DTSC), the Department of Health Services (DHS), the State Water Resources Control Board (SWRCB), and any local enforcement agency, as designated by Section 18051, Title 14 of the CCR, identify and update annually a list of sites that have been reported to have certain types of contamination. The DTSC EnviroStor database and the SWRCB Geo Tracker databases were consulted to identify if the Project site or any surrounding nearby properties are on any list compiled pursuant to Government Code 65962.5 (DTSC, SWRCB 2019). Neither the Project site nor properties within 1,000 feet are included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. No impacts would occur in relation to this issue.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard or excessive noise for people residing or working in the project area?

Less than Significant Impact. The nearest airport to the proposed Project site is the Perris Valley Airport-L65, located approximately 2.2 miles southeast of the Project site. According to the Airport Land Use Compatibility Plan for Perris Valley Airport, the Project site is not located within the Airport Influence Area Boundary (Riverside County 2010). However, the proposed Project is located within Compatibility Zone E of the March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan (Mead and Hunt 2014). Zone E is defined as having low noise impacts with occasional overflights intrusive to some outdoor activities. Zone E is also categorized as having a low risk level regarding safety and airspace protection factors. The proposed Project would not introduce new residents or any permanent onsite employees to the area. Additionally, being within Zone E, the Project site is at low risk of experiencing excessive noise or hazards related to airports. Therefore, impacts would be less than significant in relation to this issue.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

f) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Less than Significant Impact. Access to the Project area would be via Weston Road and via West Metz Road. Project-related traffic would be minimal and would not cause a significant increase in congestion. During construction of the Project, heavy construction vehicles could interfere with emergency response to the site or emergency evacuation procedures in the event of an emergency (e.g., vehicles traveling behind the slow-moving truck). However, such delays would be brief and infrequent. Moreover, as required in the City's Municipal Code Section 10.12.100, no street shall be closed or partially obstructed, or detours established, without approval of the City's traffic engineer. As a result, the Project's construction-related impacts would be less than significant.

Operation of the proposed Project would involve minimal traffic in and out of the Project site, specifically a net total of 90 weekday daily trips and 450 Saturday daily trips, with only 19 of the weekday trips and 46 of the Saturday trips being peak hour trips (Urban Crossroads, Inc. 2019). As a public park, there may be occasional special events that may require a permit from the City. If a special event is held at the park as defined in the City's Municipal Code (Section 19.060), prior to permit approval for such a special event, if warranted, the City may require a plan for ingress and egress as well as orderly traffic movement. Therefore, due to the low number of daily vehicle trips and City's permit approval process for special events, operation of the proposed Project would not significantly interfere with emergency response access, and the impacts related to the operation of the Project would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

g) Expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fires?

Less than Significant Impact. According to the Safety Element of the City of Perris General Plan, the Project site is not located in a Wildfire Hazard Area (City 2005). However, the California Department of Forestry and Fire Protection (CAL FIRE) classifies the Project site as a Very High Fire Hazard Severity Zone (VHFHSZ) on the VHFHSZ in Local Responsibility Area map for the City of Perris (CAL FIRE 2009). The proposed Project would comply with the fire prevention guidelines in the City of Perris General Plan, including adopting the latest CBC standards, and the California Fire Code to minimize impacts related to wildland fires. Compliance with applicable codes would reduce impacts associated with wildland fires. Additionally, Project-related improvements (clearing of overgrown brush and large debris piles) would further assist in reducing risks associated with high fire hazards. Therefore, the proposed Project is not anticipated to expose people or structures to wildland fires, and impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

X. HYDROLOGY AND WATER QUALITY

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?	☐	☐	■	☐
b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?	☐	☐	■	☐

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
c)	Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:				
	i. Result in substantial erosion or siltation on- or off-site?	☐	☐	■	☐
	ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off- site?	☐	☐	■	☐
	iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional resources of polluted runoff?	☐	☐	■	☐
	iv. Impede or redirect flood flows?	☐	☐	■	☐
d)	In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?	☐	☐	■	☐
e)	Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?	☐	☐	☐	■

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris Municipal Code Section 14.22.090

Section 14.22.090 of the City of Perris Municipal code requires the preparation and implementation of a water quality management plan (WQMP) for new development or significant redevelopment.

City of Perris General Plan – Conservation Element

Policy VIII.A Adopt and maintain development regulations that encourage water and resource conservation.

Implementation VIII.A.5: Use permeable paving materials within developments to deter water runoff and promote natural filtering of precipitation and irrigation waters.

Explanation of Checklist Answers

CValdo prepared a WQMP (CValdo 2020a) and a Drainage Study (CValdo 2020b) for the proposed Project. These documents are used to respond to the threshold questions below and are included as Appendix D of this IS/MND.

Would the Project:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality?

Less than Significant Impact. While 72 percent of the site would remain in its present natural state, the Project would involve clearing and grading during construction and once operational would include some impervious surfaces and new land uses that could result in sheet flow and discharges of pollutants. Generally, fluid spills from vehicles or maintenance equipment as well as runoff of pesticides and herbicides could occur. National Pollutant Discharge Elimination System (NPDES) permits are required for discharges of pollutants to navigable waters of the United States, and discharge of any nonpoint or point source runoff to navigable water is illegal without an NPDES permit. The RWQCB issues these permits under the federal Clean Water Act. As a Co-Permittee with the County of Riverside, the City of Perris must adhere to two NPDES permits for control of urban runoff - the Riverside County Municipal Separate Storm Sewer System (MS4) NPDES Permit and the San Jacinto Watershed Construction Activities Permit. Co-Permittees are required to adopt and enforce grading and/or erosion control ordinances, guidelines and various Best Management Practices (BMPs) for commercial, municipal, and industrial activities. BMPs include a variety of nonstructural design controls to control water pollution sources, as well as structural mechanisms of detaining and filtering runoff prior to release to the storm drain system.

In addition, the City would be required to implement a SWPPP to reduce pollutants in the stormwater to the maximum extent practicable during construction. The SWPPP must include erosion-control and sediment-control BMPs that would meet or exceed measures required by the determined risk level of the construction site, in addition to tracking control, waste management, and non-stormwater control BMPs that reduce the potential for construction-related stormwater pollutants.

As a condition of the NPDES permits the City was required to adopt an ordinance establishing stormwater and urban runoff management and discharge control (City Ordinance No. 1194) and is required to consider water quality impacts during the project review and approval phases to ensure that appropriate BMPs are incorporated into the project design and long-term operations. For new development and substantial redevelopment, a condition of project approval is compliance with the applicable RWQCB permits. To satisfy these requirements, CValdo prepared preliminary WQMP that includes a series of applicable BMPs.

The preliminary WQMP (PWQMP) is based upon the Project’s conceptual site plan (Figure 3); the final WQMP would be prepared at the time of final site design and approval and approved by the City of Perris Public Works Department prior to the issuance of grading permits. The RWQCB WQMP Guidance Document serves as the foundation for the preparation of the Project-specific WQMP. As such, CValdo delineated and mapped the individual drainage management areas (DMAs) on the site. Two DMAs were identified; a riparian area of natural vegetation that currently self-treats off-site flows (DMA 1) and an area that would support the runoff from Project-related features such as concrete roofs, hardscapes, etc. as well as some of the current offsite runoff (DMA 2) (see Figures 1 and 2 of the WQMP in Appendix D of this IS/MND). As discussed in Section 2.0, Project Description of this IS/MND, the City would construct an underground storm drain that would redirect offsite flows from the northern boundary. If offsite flows are not redirected the Project would be required to treat the offsite flows that would be conveyed from the north directly to the riparian area. As such, off-site flows are considered to be pass-through and would not mix with any flows from developed portions of the site and the Project would not be responsible for treatment. The natural vegetation in the riparian areas would continue to filter and stabilize the off-site runoff. The new Project-related discharges from DMA 2 would be transported to the proposed onsite bioretention basin (see Figure 3, Site Plan of the IS/MND) in the southwest portion of the site.

Once the DMAs are established, the next step in the PWQMP is to identify the appropriate low impact development (LID) BMPs for maintenance of water quality. The standard LID BMPS include infiltration, harvest and reuse, or bioretention/treatment. If none of the three LID BMPs are feasible, a project may apply for a waiver of alternative compliance. The worksheets provided in the PWQMP provide a formula and methodology for identifying and implementing the appropriate LID BMPs. As noted, the Project includes a bioretention basin. This basin serves the dual function of the retention and treatment of runoff. The collected runoff from DMA 2 would percolate through the bioretention basin and pollutants and nutrients associated with stormwater run-off would be naturally removed through a series of physical and biological processes. Additionally, CValdo calculated the required size of the proposed basin to capture the volume of projected runoff. As shown in the calculation worksheets of the WQMP, the required size of the basin is 16,812 cubic feet (cf); the proposed size of the basin is 20,000 cf, thereby meeting the requirement.

Further, as part of the NPDES permitting process source control features are required to be implemented as part of the final WQMP. The WQMP identifies a series of standard permanent and operational source control BMPS that would be incorporated as Project design features:

- Stencil storm drain inlets to identify no dumping (permanent).
- Design landscaping to minimize runoff.
- Provide signage stating that hazardous materials are prohibited to be discarded in onsite receptacles (permanent).
- Inlet cleaning and repaint stenciling when necessary (operational).
- Use minimum amount of pesticide (operational).
- Provide adequate number of receptables. Inspect receptacles regularly, and repair or replace leaky receptacles. Prohibit/prevent dumping of liquid or hazardous wastes. Inspect and pick up litter daily. Keep spill control materials onsite.
- Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect wash water containing any cleaning agent or degreaser and discharge to the sanitary sewer not a storm drain.

In addition, MM BIO-3, included within this IS/MND (See Section IV, Biological Resources) requires construction fencing and silt traps; this would further reduce the potential for sedimentation or other construction-related pollutants from entering and contaminating area water sources. Given that the Project would include features to prevent the mixing of onsite and offsite runoff; include the retention and treatment of the Project-related runoff in addition to the required adherence to an approved WQMP; and implement MM BIO-3; the Project would have a less than significant impact in relation to this issue.

Mitigation Measure(s)

No additional mitigation measures are required beyond MM BIO-3.

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin?

Less than Significant Impact. The San Jacinto Groundwater Basin underlies the valleys of San Jacinto, Perris, Moreno Valley, and Menifee in western Riverside County. This basin is bound by the San Jacinto Mountains, San Timoteo Badlands, Box Mountains, Santa Rosa Hills and Bell Mountain, and unnamed hills. Natural recharge to the San Jacinto groundwater basin is primarily from percolation of flows in the San Jacinto River and its tributary streams, with percolation of water stored in Lake Perris as an additional source of recharge.

Approximately 72 percent of the site is to remain in its natural condition. Site improvements on the remaining 28 percent of the site would include the park features as shown in Figure 3. A portion of these features would require irrigation; however, this be achieved through the use of reclaimed water, thereby not depleting groundwater resources. Other features, such as the parking lot or basketball courts would be covered with impervious or semi-pervious materials, which could have the potential for ponding and reducing groundwater recharge if not designed to redirect flows. However, flows are directed to the onsite bioretention basin, allowing for recharge, as discussed above under item X.a above.

The Project does not involve the installation of groundwater wells or other infrastructure that would deplete groundwater supplies and it would not impede recharge; thus, the Project would have a less than significant impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

   i. Result in substantial erosion or siltation on- or off-site?

Less than Significant Impact. To maintain water quality at the site, some of the existing drainage patterns would be altered. As discussed in item X.a above, to prevent the mixing of offsite runoff and onsite runoff, the Project includes the installation of an underground storm drainpipe to convey the northern offsite flows to the riparian area in the southeastern portion of the site. It is noted that under present conditions, much of the offsite flow entering the Project site from the north does eventually drain to the riparian area; the pipe is solely a water quality feature to prevent mixing of the existing northerly offsite flows from mixing with any new Project-related flows. The remaining offsite flows that currently enter the site would continue to naturally drain towards the riparian area.

As noted in the drainage study, during construction, the site would be graded to retain the original points of run-on and runoff, minimizing the alteration of drainage patterns. Additionally, the southeast portion of the site, which serves as a major support of run-on and runoff on the site, would be preserved in a natural condition. Overall, 72 percent of the site would be retained in its present state. Additionally, the Project includes a bioretention basin that has been adequately sized to capture runoff. By designing the basin as a combined water quality/detention basin (bioretention), the change in runoff as a result of the Project would not substantially change from existing conditions. Therefore, construction of the Project would not substantially alter the existing drainage pattern of the site or area, resulting in substantial erosion of siltation, because drainage would operate similar to current conditions. Impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or off- site?

Less than Significant Impact. As stated above in item X.c.i, the incorporation of impervious surfaces introduced by the Project would be minimal, as approximately 72 percent of the site would remain in a natural condition. Additionally, the on-site drainage patterns would not be significantly changed from current conditions. The existing drainage points for the site would be retained, and as required by the LID, the amount of water discharge from the site would be similar to existing conditions through the incorporation of a bioretention basin. Therefore, the rate or amount of surface runoff would not substantially increase resulting in flooding on- or off-site. Impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional resources of polluted runoff?

Less than Significant Impact. As stated above in item X.c.i, the incorporation of impervious surfaces introduced by the Project would be minimal, as approximately 72 percent of the site would remain in a natural condition. As such, the increase of runoff water due to the increase of impervious surfaces introduced by the Project would be minimal. Furthermore, the on-site drainage patterns would not be significantly changed from current conditions. The existing drainage points for the site would be retained, and the amount of water discharge from the site would be similar to existing conditions through the incorporation of the bioretention basin. Therefore, the Project would not create or contribute a significant amount of runoff water. In regard to polluted runoff, the Project the bioretention basin serves a dual purpose to retain and treat and the project would incorporate as required the BMPs identified in item X.a above to further minimize impacts related to pollutants. As such, impacts would be less than significant in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

iv. Impede or redirect flood flows?

Less than Significant Impact. As stated above in item X.c.i, construction of the proposed Project would not significantly change the current drainage patterns on the site. Additionally, the existing drainage points for the site would be retained, and the amount of water discharge from the site would be similar to existing conditions through the incorporation of the bioretention basin. Therefore, the flow of water would not be significantly altered thereby impeding or redirecting flood flows through implementation of the Project. Impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

d) In flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation?

Less than Significant Impact. According to the Safety Element of the City of Perris General Plan, the Project site is not located within a Special Flood Hazard Area Inundated by 100-Year Flood Zone (City 2005). Additionally, the Federal Emergency Management Agency (FEMA) Flood Map Service Center classifies the Project site as an Area of Minimal Flood Hazard (FEMA 2008). Therefore, impacts related to flood hazards are less than significant for the Project. Tsunamis are usually caused by displacement of the ocean flood causing large waves and are typically generated by seismic activity. The proposed Project is located approximately 33 miles from the Pacific Ocean; therefore, risks from a tsunami are not present for the Project site. A seiche is a standing wave in an enclosed or partly enclosed body of water. Seiches are normally caused by earthquake activity, and can affect harbors, bays, lakes, rivers, and canals. The nearest body of water, Perris Reservoir, is approximately 5.5 miles away, which is too far to present impacts by a seiche event. Impacts relating to the release of pollutants due to tsunamis or seiches event would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

e) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan?

No Impact. As state in item X.b above, the Project would not deplete or interfere with groundwater supplies.

The Project site is located within the Santa Ana River Basin and Project-related construction and operational activities would be required to comply with the Santa Ana RWQCB's Santa Ana River Basin Water Quality Control Plan by preparing and adhering to a SWPPP and WQMP and by installing and maintaining BMPs, thus ensuring that the Project would not conflict with or obstruct the Santa Ana River Basin Water Quality Control Plan.

As stated above in item X.a, the Project would adhere to the requirements of the NPDES permits. Appropriate BMPs would be incorporated into the Project design and long-term operations. For new development and substantial redevelopment, a condition of project approval is compliance with the applicable RWQCB permits. To satisfy these requirements, CValdo prepared a preliminary WQMP that includes a series of applicable BMPs that would be implemented for the proposed Project. Additionally, the Project would comply with all storm water quality standards during construction and operation. Adhering to the BMPs and all storm water quality standards would minimize any potential negative impacts associated with hydrology and water quality. Implementation of the proposed Project would not conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan. There would be no impact.

Mitigation Measure(s)

No mitigation measures are required.

XI. LAND USE AND PLANNING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Physically divide an established community?	☐	☐	☐	■
b) Cause significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?	☐	■	☐	☐

Applicable General Plan Policies, Ordinances, and Regulations

As applicable Sections I-XX of this IS/MND identify the General Plan policies and City ordinances that relate to the proposed Project. These policies and ordinances either set a standard for determining a potential impact (i.e., compliance with an established air quality threshold or noise standard) or provide a foundation for mitigating an impact (i.e., limiting the hours of construction or requiring BMPS). Please see the individual environmental issue areas for specific policies and ordinances.

Explanation of Checklist Answers

Would the Project:

a) Physically divide an established community?

No Impact. The physical division of an established community typically refers to the construction of a linear feature, such as an interstate highway or railroad tracks, or removal of a means of access, such as a local road or bridge that would impact mobility within an existing community or between a community and outlying area. Conversely, this Project, a public park, would serve to connect the community. The Project site is completely surrounded by single family residential homes and members of the surrounding neighborhoods have established unofficial land uses on the site, such as the BMX course. The park would maintain and improve this feature as well as enhance some of the other features at the site like Owl Rock, which will be retained and incorporated as part of a larger public art installation (art rocks). Thus, the proposed Project would not physically divide an established community and no adverse impacts would occur in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

b) Cause significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect?

Less than Significant with Mitigation Incorporated. The Project site and surrounding areas have a land use designation of Single-Family Residential (R 6,000) in the City of Perris General Plan and are zoned as a Mobile Home Subdivision (R5; City 2013; City 2016). The Project proposes a public park, which does not conflict with the Single- Family Residential land use designation or the Mobile Home Subdivision zoning. The Land Use Element of the City of Perris General Plan specifically states that the region, categorized as Planning Area 7: Westside Residential in the General Plan, needs active parkland and sports fields for use by the residents. As such, implementation of the proposed Project would align with the goals in the General Plan. Moreover, as discussed in Section XVI, Recreation, of this IS/MND, City Ordinance 953 states that the City is to provide 5 acres or parkland per 1,000 residents. Because the City is not currently meeting this standard, the addition of nearly 23 acres of parkland would assist the City of achieving the standard.

As discussed throughout this document, the Project would have the potential to violate certain standards (i.e., an established noise threshold) and thereby conflict with a land uses plan, policy, or regulation adopted for the purposed of avoiding or mitigating an environmental effect. These impacts (biological resources, cultural resources and noise) would be potentially significant. Therefore, the Project would have a potential adverse impact in relation to this issue.

Mitigation Measure(s)

See mitigation measures BIO-1, BIO-2, BIO-3, CUL-1, CUL-2, and NOI-1. With the implementation of mitigation measures BIO-1, BIO-2, BIO-3, CUL-1, CUL-2, and NOI-1, impacts are reduced to less than significant.

XII. MINERAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	■
b) Result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	■

Applicable General Plan Policies, Ordinances, and Regulations

There are no mineral resources-related General Plan policies, ordinances, or regulations that are applicable to the proposed Project.

Explanation of Checklist Answers

Would the Project:

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

No Impact. The California Department of Conservation classifies the availability of mineral resources in a region into four mineral resource zone (MRZ) categories: MRZ 1 for no mineral resources, MRZ 2 for significant resources areas with the quality and quantity known, MRZ 3 for significant resource areas with the quality and quantity unknown, and MRZ 4 for areas with no information. According to the City of Perris General Plan, the CDC is primarily interested in the preservation of significant resources in MRZ 2 regions. The land within the City of Perris is classified as MRZ 3 and MRZ 4, which are not considered to be significant resource areas (City 2005). Implementation of the proposed Project would not result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state. Therefore, impacts would not occur in relation to this issue.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?

No Impact. As stated above in item XII.a, the City of Perris General Plan does not consider the Project site to be a significant mineral resource area. Additionally, the Project area is not used for mineral extraction and is not known as a locally important mineral resource recovery site. Further, the Project area is not delineated on any plan for mineral resource recovery uses. As such, no impacts would occur in relation to this issue.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

XIII. NOISE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in:				
a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	☐	■	☐	☐
b) Generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	■	☐
c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	■

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris Municipal Code Section 7.22.040

No person shall cause the amplification of sound within a park or recreation facility if the noise level caused thereby exceeds 60 decibels from all channels of equipment used, except pursuant to a permit issued by the city manager, and in compliance with the following conditions:

a. The location of each bandstand and gathering, and the position of each loudspeaker shall be as specified in writing by the city manager so as to cause the least amount of disturbance to other persons, both within and without the park or recreation facility. The power source for amplifier shall be provided by the city, battery or generator.

b. Amplified sounds shall not exceed 60 decibels at a point 50 feet in front of the midpoint of a straight line between any two loudspeaker installations.

City of Perris Municipal Code Section 7.34.060

It is unlawful for any person between the hours of 7:00 p.m. of any day and 7:00 a.m. of the following day, or on a legal holiday, with the exception of Columbus Day and Washington's birthday, or on Sundays to erect, construct, demolish, excavate, alter or repair any building or structure in such a manner as to create disturbing, excessive or offensive noise. Construction activity shall not exceed 80 dBA in residential zones in the City.

Explanation of Checklist Answers

The discussion below is based the Noise Analysis Letter Report prepared by HELIX (2019b), attached to this IS/MND as Appendix E.

Would the Project:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Less than Significant Impact with Mitigation Incorporated. The proposed Project would generate noise levels during Project construction and operations as discussed below.

<u>Construction</u>

Construction of the proposed Project is anticipated to involve rock clearing/breaking, grading, facilities construction, and paving. The magnitude of the impact would depend on the type of construction activity, equipment, duration of each construction phase, distance between the noise source and receiver, and intervening structures. Construction would generate elevated noise levels that may be audible at nearby residential uses in the vicinity of the Project site.

Construction equipment would not all operate at the same time or location. Furthermore, construction equipment would not be in constant use during the 12-hour operating day. Table 7 *Construction Equipment Noise Levels*, provides the 50-foot distance maximum noise levels (L_{MAX}) and time-averaged noise levels (L_{EQ}) for commonly used construction equipment.

Table 7
CONSTRUCTION EQUIPMENT NOISE LEVELS

Unit	Percent Operating Time	dBA L_{MAX} at 50 feet	dBA L_{EQ} at 50 feet
Backhoe	40	77.6	73.6
Breaker	20	90.3	80.3
Compactor	20	83.2	76.2
Compressor	40	77.7	73.7
Concrete Mixer Truck	40	78.8	74.8
Concrete Pump Truck	20	81.4	74.4
Dump Truck	50	76.5	72.5
Drum Mixer	40	80.0	77.0
Medium Excavator	40	78.0	74.0
Large Excavator	40	80.7	76.7
Front-End Loader	40	79.1	75.1
Grader	40	85.0	81.0
Paver	50	77.2	74.2
Roller	20	80.0	73.0

Source: USDOT 2008

It is anticipated that rock breaking and subsequent rock removal would be required for the proposed Project to remove boulders from areas prior to grading. Rock breaking, if necessary, would likely be achieved via an excavator-mounted breaker. The use of this equipment would occur at variable locations across the site, based on the locations of individual rocks that need to be broken prior to removal. Because the exact locations of this activity are unknown, a setback distance is provided for planning purposes. Assuming a 10 percent hourly operating time, a breaker used within 50 feet of a residence would generate noise levels above 80 dBA.

Construction grading activities would be required throughout various portions of the site, including the locations of the proposed parking lots and multi-use field. A grader would be used and, due to its mobile nature, would operate at an average distance of approximately 200 feet from the nearest residences over the course of a workday. Based on this average distance, a grader would generate an hourly noise level of 69.0 dBA L_{EQ} at 200 feet. This level could be higher or lower during the course of a given day as the equipment travels across the site.

Construction of the proposed facilities, including the play areas, restrooms, picnic shelters, and splash play, would occur at various locations throughout the site. A loader/backhoe would likely be used in construction for each of the listed facilities. The construction of the picnic shelter would occur in the closest proximity to the existing residences. Construction of the shelter would involve the use of a loader/backhoe within approximately within 190 feet from the residences in the northern of the Project site. Given this distance, the use of a loader/backhoe would generate an hourly noise level of 62.0 dBA L_{EQ} at 190 feet.

Paving would be required at the locations of the proposed parking lots. A roller and then a paver would likely be used and, due to their mobile nature, would operate at an average distance of approximately 200 feet from the nearest residences over the course of a workday Given this distance, a roller would generate a noise level of 61.0 dBA L_{EQ} and a paver would generate a noise level of 62.2 dBA L_{EQ} at a distance of 200 feet, which could be higher or lower during the course of a given day as the equipment travels across the site.

As referenced above, Chapter 7.34.060 of the City's Municipal Code prohibits construction between the hours of 7:00 p.m. and 7:00 a.m. and on Sundays and legal holidays, with the exception of Columbus Day and Presidents' Day. Additionally, construction noise levels are limited to 80 dBA in residential zones in the City. Project-related construction activities are scheduled to occur within the hours specified in the City's Municipal Code, and grading, construction, and paving activities would not exceed the 80 dBA limit in residential zones in the City. However, since rock breaking may occur within 50 feet of residences, the proposed Project could result in a violation of the City's construction noise standard. Construction noise impacts would be potentially significant, and mitigation measure MM NOI-1, detailed below, would be required.

<u>Operations</u>

Chapter 7.34.050 of the City's Municipal Code limits exterior noise levels at residential properties to a maximum noise level (L_{MAX}) of 80 dBA L_{MAX} from 7:01 a.m. to 10:00 p.m. and 60 dBA L_{MAX} from 10:01 p.m. to 7:00 a.m. However, a maximum noise level limit is not the most appropriate metric to use in the analysis for the Project because operation of the park would generate noise levels that would continuously fluctuate over time. The noise level metric appropriate to use in this analysis is a time-averaged noise level (L_{EQ}). Therefore, this analysis incorporates residential land use noise standards from the County of Riverside General Plan Noise Element, which utilize an L_{EQ} metric. These standards are shown in Table 8, *Stationary Source Residential Land Use Standards*.

Table 8
STATIONARY SOURCE RESIDENTIAL LAND USE STANDARDS

Time Period	Standard (dBA L_{EQ} [10 minute])	
	Interior	Exterior
10:00 p.m. to 7:00 a.m.	40	45
7:00 a.m. to 10:00 p.m.	55	65

Source: Riverside County 2015
dBA = A-weighted decibel; L_{EQ} = time averaged noise level

The proposed Project would include a variety of uses throughout the site that would produce noise. Generally, these uses would be associated with daytime recreation activities and would not generate high levels of noise. In addition, a substantial amount of noise generated on site would not be audible due to the large area of the site and distance from the noise sources to off-site receivers.

Of the Project's various proposed park uses, the primary noise-generating uses would include the multi-use sports field, child play area, splash play, and basketball courts. The proposed multi-use sports field is anticipated to be located at an average distance of approximately 300 feet from the nearest property line, and noise levels at the residences are assumed to be less than 61.2 dBA L_{EQ}. The child play area and splash play would be located in the southern half of the site, approximately 170 feet and 320 feet from the nearest residential property lines, respectively. The child play area is estimated to generate a noise level of 49.3 dBA L_{EQ} at the site's southern property line and the splash play is estimated to generate a noise level of 43.7 dBA L_{EQ} at the site's eastern property line. The proposed basketball courts would be located as close as approximately 100 feet from the nearest property line. It is estimated that the proposed basketball courts would generate a noise level of 41.8 dBA L_{EQ} at the nearest property line. The operational noise associated with the multi-use sports field, child play area, splash play, and basketball courts would each be below the 65-dBA L_{EQ} daytime exterior noise level threshold.

Vehicular traffic noise is also a consideration for the operation of the park. The proposed Project is estimated to generate 90 daily trips, with 19 trips during the peak hour, on weekdays and 450 daily trips, with 46 trips during the peak hour, on Saturdays (Urban Crossroads, Inc. 2019). Due to the low levels of vehicular traffic, noise levels are not anticipated to substantially increase noise levels at residences along local roadways in the vicinity of the Project site. In addition, because the Project includes two entrances, one on each end of the park site, not all vehicular traffic would travel along the same roadways. Noise levels generated from the operation of the proposed Project would be below the relevant thresholds, and impacts would be less than significant.

<u>Mitigation Measure(s)</u>

MM NOI-1 **Construction Noise Limits for Rock Breaking.** Noise generated during construction activities, including rock breaking, shall not exceed 80 dBA L_{EQ} (one hour) at off-site residential properties. Since rock breaking within 50 feet of residential properties would exceed 80 dBA, no rock breaking within 50 feet of residential properties shall occur.

With implementation of mitigation measure MM NOI-1, impacts related to the proposed Project's construction and operational noise would be less than significant.

b) Generation of excessive groundborne vibration or groundborne noise levels?

Less than Significant Impact. The primary potential for generation of groundborne vibration would occur during construction, specifically the use of a vibratory roller primarily used in areas that would be paved. According to Caltrans' Transportation and Construction Vibration Guidance Manual, the distinctly perceptible vibration annoyance potential criterion is defined as 0.04 inches/second (in/sec) peak particle velocity (PPV) for continuous/ frequent intermittent sources (Caltrans 2013). Due to its mobile nature, the use of a vibratory roller during construction would occur at an average distance of 200 feet from the nearest off-site residential land uses. At a distance of 200 feet, a vibratory roller would create a PPV of 0.02 in/sec, which is below the threshold defined by Caltrans. As such, implementation of the proposed Project would not generate excessive groundborne vibration. Impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

c) For a project located within the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

No Impact. As noted in Section IX.e, the nearest airport to the proposed Project site is the Perris Valley Airport-L65, located approximately 2.2 miles southeast of the Project site. According to the Airport Land Use Compatibility Plan for Perris Valley Airport, the Project site is not located within the Airport Influence Area Boundary (Riverside County 2010). However, the proposed Project is located within Compatibility Zone E of the March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan (Mead and Hunt 2014). Zone E is defined as having low noise impacts with occasional overflights intrusive to some outdoor activities. The proposed Project would not increase the number of residents in the area or include permanent onsite employees. Therefore, no impacts would occur in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

XIV. POPULATION AND HOUSING

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	☐	☐	☐	■

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	■

Applicable General Plan Policies, Ordinances, and Regulations

There are no population and housing-related General Plan policies, ordinances, or regulations that are applicable to the proposed Project.

Explanation of Checklist Answers

Would the Project:

a) Induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?

No Impact. The proposed Project does not include housing or commercial development that would directly or indirectly affect the number of residents in the area and would not contribute to the creation of additional housing in the City of Perris. The Project includes minimal roadway/infrastructure improvements that are intended to solely serve the site and would not be of a magnitude to support additional population growth in the area. As discussed in this IS/MND, the Enchanted Hills area is considered to be park deficient and the proposed park is intended to serve the existing population. The proposed Project concept would provide approximately 23 acres of a variety of recreational activities for the existing neighborhoods. Therefore, since the Project is intended to serve the existing population and has no other features that would directly or indirectly induce growth, no impacts would occur in relation to this issue.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

b) Displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere?

No Impact. The proposed Project includes the development of a park on land that is not currently used for housing. The proposed Project would not remove housing and would not displace substantial numbers of people or housing, necessitating the construction of replacement housing elsewhere. Therefore, no impacts would occur in relation to this issue.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

XV. PUBLIC SERVICES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
a) Fire protection?	☐	☐	■	☐
b) Police protection?	☐	☐	■	☐
c) Schools?	☐	☐	☐	■
d) Parks?	☐	☐	■	☐
e) Other public facilities?	☐	☐	☐	■

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris Ordinance 953

Ordinance 953 establishes that the City is required to have 5 acres of parkland for each 1,000 persons residing in Perris.

City of Perris General Plan Safety Element

Policy II.B Provide adequate emergency facilities to serve existing and future residents.

Explanation of Checklist Answers

Would the project:

a) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection?

Less than Significant Impact. The proposed Project does not include the construction and operation of any new fire protection facilities nor would it create a demand for additional facilities. The Project would not directly or indirectly introduce any new residents or employees to the Project site or the City that would increase the demand for services. The Project site currently has limited access, overgrown brush, and several debris piles as well as scattered large pieces of discarded furniture and other objects throughout the site (see Figure 4). Implementation of the Project would improve access, maintain the natural vegetation for fire safety, and remove the piles of debris, which reduce the risk of fire hazards and the need for fire protection services. The Riverside County Fire Department currently provides fire protection services in the Project area and no new facilities, equipment, or staff would be required to continue to provide fire protection to the area. There may be occurrences or events where paramedics or other fire protection personnel would be needed to provide services at the site; however, this could be handled with the existing resources. Therefore, the Project would have a less than significant impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

b) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for police protection?

Less than Significant Impact. The proposed Project does not include the construction and operation of any new police protection facilities nor would it create a demand for additional facilities. The Project would not directly or indirectly introduce any new residents or employees to the Project site or the City that would increase the demand for services. Rather, the Project would introduce security lighting to an area that currently is unlit, deter the illegal dumping, and provide a safe gathering place for the community. The Riverside County Sheriff's Department provides law enforcement services in the Project area and no new facilities, equipment, or staff would be required to continue to provide police protection to the area. There may be times where police protection services would be required to maintain a safe park environment; however, such calls could be handled with the sheriff department's current resources. Therefore, the Project would have a less than significant impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

c) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for schools?

No Impact. The proposed Project involves the construction of a park in an established neighborhood and would be serving the needs of those residents. It is not anticipated to introduce new residents to the Project area that would require additional schools. No impacts would occur in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

d) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for parks?

Less than Significant Impact. The proposed Project involves the construction of an approximately 23-acre park which includes a multi-use field, child play area, toddler play area, restrooms, picnic shelters, hardscape, parking lots, bridges, trails, a basketball court, BMX course improvements, a splash pad, a skating area, and a zip line that is intended to serve the existing population. Implementation of the proposed Project would introduce a park in an area of the City that has been identified as having a deficient amount of parkland acreage to serve the existing community. The proposed Project would improve the City's ratio of the number of acres of parkland per population, assisting the City in achieving its General Plan goal of providing an additional 80.5 acres of parkland within the City (City 2005). The environmental impacts of the proposed Park are discussed within items I-XXI of this IS/MND, and with mitigation proposed within this document, potential environmental impacts would be reduced to a less than significant level. Therefore, the Project would have a less than significant impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

e) Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for other public facilities?

No Impact. Other public facilities may include libraries, senior centers, community centers, and pools, all of which are intended to serve the general public. The proposed Project involves the construction of a park to primarily serve the existing population within the Enchanted Hills area of the City and would not directly or indirectly introduce any new residents that would require additional public facilities. Therefore, no impacts would occur in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

XVI. RECREATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	■
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?	☐	■	☐	☐

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris Ordinance 953

Ordinance 953 establishes that the city is required to have 5 acres of parkland for each 1,000 persons residing in Perris.

City of Perris General Plan Open Space Element

Policy I.A Develop more recreational parks.

Explanation of Checklist Answers

Would the Project:

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

No Impact. The proposed Project consists of construction of a park intended to serve an area that is currently park deficient as determined by the City's standards set forth in Ordinance 953. The Project would not introduce residents or create the need for new facilities. Conversely, the Project would add approximately 23 acres of recreational space to the existing neighborhood and would likely alleviate some of the demand that these residents may be placing on other recreational facilities in the surrounding area. The proposed Project would not result in physical deterioration of an existing open space area or any recreation facilities. Therefore, no impacts would occur in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

b) Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?

Less than Significant Impact with Mitigation Incorporated. The Project is the construction of a park, which as identified in this IS/MND could lead to potentially significant impacts if left unmitigated. However, mitigation as set forth in this document would serve to reduce any potential impacts to less than significant.

Mitigation Measure(s)

Please see mitigation measures MM BIO-1, MM BIO-2, MM CUL-1, MM CUL-2, and MM NOI-1 of this IS/MND. No additional mitigation measures are required.

XVII. TRANSPORTATION

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?	☐	☐	■	☐
b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?	☐	☐	■	☐
c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	■	☐
d) Result in inadequate emergency access?	☐	☐	■	☐

Applicable General Plan Policies, Ordinances, and Regulations

There are no transportation-related General Plan policies, ordinances, or regulations that are applicable to the proposed Project.

Explanation of Checklist Answers

The discussion below is based the Enchanted Hills Park Focused Traffic Assessment prepared by Urban Crossroads, Inc. (Urban Crossroads, Inc. 2019), attached to this IS/MND as Appendix F.

Would the Project:

a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities?

Less than Significant Impact. The proposed Project involves the construction of a park that includes a multi-use field, child play area, toddler play area, restrooms, picnic shelters, hardscape, parking lots, bridges, trails, a basketball court, BMX course improvements, art rocks, a splash pad, a skating area, and a zip line. Estimated trip generation, based upon the specific land use for the Project, is shown in Table 9, *Project Trip Generation Summary*.

Table 9
PROJECT TRIP GENERATION SUMMARY

Land Use	Quantity	Units	AM Peak Hour Total	PM Peak Hour Total	Weekday Daily	Saturday Peak Hour Total	Saturday Daily
Public Park	22.0	Acres	0	2	18	6	44
Soccer Complex	1	Field	1	17	72	40	406
		Total	**1**	**19**	**90**	**46**	**450**

Source: Urban Crossroads, Inc. 2019 (Appendix F).

As shown in Table 9, the Project is anticipated to generate a net total of 90 weekday vehicle trips per day, which includes 19 PM peak hour trips. The Project is anticipated to generate approximately 450 vehicle trips per day on a Saturday, which includes 46 peak hour trips. According to the Focused Traffic Assessment, the Project is anticipated to generate a relatively low traffic volume (Urban Crossroads, Inc. 2019); as such, traffic impacts resulting from the Project would be minimal and would not conflict with a program plan, ordinance or policy addressing the circulation system.

Construction would primarily occur within the Project site; however, the Project would include minor roadway improvements as part of the Project design. Within the Project boundary, the Project would incorporate on-site signing and road striping in conjunction with detailed construction plans for the site. Outside of the Project boundary, Weston Road and Metz Road are currently constructed at their ultimate full-section width as local streets within the Project area, consistent with the City's General Plan Circulation Element. As part of the Project, the City would improve Weston Road and Metz Road by constructing them to their full-section length as local streets along the Project boundary. As shown in the City of Perris General Plan Circulation Element (City 2008), local streets are to have a total 60-foot wide right-of-way and a curb to curb width of 40 feet. Six-foot sidewalks are included in both directions. At the time of preparation and prior to the approval of final grading, landscape, and street improvement plans the Project would be required to demonstrate compliance with sight standards as determined by Caltrans and the City. Improvements related to the Project would adhere to applicable standards and would not conflict with a program plan, ordinance or policy addressing the circulation system. Thus, the Project would have less than significant impacts in relation to this issue.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

b) Would the project conflict or be inconsistent with CEQA Guidelines section 15064.3, subdivision (b)?

Less than Significant Impact. The analysis of vehicle miles traveled (VMT) in CEQA Guidelines section 15064.3 provides that transportation impacts of Projects are, in general, best measured by evaluating the Project's VMT. VMT reflects both the number and the distance of the trips taken. Construction activities would require the delivery of construction equipment and materials to the Project site, in addition to the removal of construction waste from the site; however, such trips would be both brief and infrequent.

According to the Enchanted Hills Park Focused Traffic Assessment, the Project would create a relatively low traffic volume (Urban Crossroads, Inc. 2019). As stated above in item XVII.a, operation of the proposed Project is estimated to result in 19 weekday peak hour trips and 46 Saturday peak hour trips.

Additionally, the proposed Project would primarily serve as a park for nearby residents; according to the City of Perris General Plan Open Space Element, the service area for community parks, such as the proposed Project is 3 miles (City 2006). Currently, the closest park to the surrounding neighborhood residents is Metz Park, located approximately 1.4 mile east of the site, or approximately 2.8 miles from the site through roadways. By providing a closer recreational area to the surrounding residents, the overall number and distance of trips taken by local residents would decrease. Additionally, the proposed park is within walking distance for many local residents, which would eliminate a portion of trips to recreational facilities altogether. Due to relatively low number and distance of trips generated by the Project, implementation of the proposed Project would not substantially increase vehicle miles traveled during construction or operation. As such, the Project would not conflict or be inconsistent with CEQA Guidelines Section 15064.3 and impacts would be less than significant in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Less than Significant Impact. There would be no hazardous design features or incompatible uses introduced as a result of the Project. The Project involves the construction of a park that includes a multi-use field, child play area, toddler play area, restrooms, picnic shelters, hardscape, parking lots, bridges, trails, a basketball court, BMX course improvements, art rocks, a splash pad, a skating area, and a zip line. As stated above in item XVII.a, the site would have three access points: one at the intersection of Weston Road and Diana Street and two that form a horseshoe drive adjacent to and accessible from Metz Road. Per the recommendations of the Focused Traffic Assessment, the Project would incorporate as project design features on-site signing and road striping in conjunction with detailed construction plans for the site, which would help to minimize traffic hazards associated with the Project. The Project would also improve Weston Road and Metz Road to their full local street alignment along the Project boundary. Additionally, at the time of preparation and prior to the approval of final grading, landscape, and street improvement plans the Project would be required to demonstrate compliance with sight standards as determined by Caltrans and the City. Such improvements would help to minimize traffic hazards in the area surrounding the Project site. The Project would not substantially increase hazards due to a geometric design feature or incompatible use, and impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

d) Result in inadequate emergency access?

Less than Significant Impact. The Project area would be accessed via Weston Road and via West Metz Road. Project-related traffic would be minimal and would not cause a significant increase in congestion. During construction of the Project, heavy construction-related vehicles could interfere with emergency response to the site or emergency evacuation procedures in the event of an emergency (e.g., vehicles traveling behind slow-moving trucks). However, such delays would be brief and infrequent. Moreover, as discussed in Section IX, Hazards of this IS/MND the Project would be required to adhere to the City of Perris Municipal Code Section 10.12.100, which stipulates that no street shall be closed or partially obstructed, or detours established, without approval of the City's traffic engineer. As a result, the Project's construction-related impacts would be less than significant.

Operation of the proposed Project would involve minimal traffic in and out of the Project site, specifically a net total of 90 weekday daily trips and 450 Saturday daily trips, with 19 of the weekday trips and 46 of the Saturday trips being peak hour trips (Urban Crossroads, Inc. 2019). The Project includes three ingress/egress points accessible from both the north and south. Therefore, operation of the proposed Project would not significantly interfere with emergency access, and the impacts related to the operation of the Project would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

XVIII. TRIBAL CULTURAL RESOURCES

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or	☐	■	☐	☐
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.	☐	■	☐	☐

Applicable General Plan Policies, Ordinances, and Regulations

There are no specific tribal cultural resources-related General Plan policies, ordinances, or regulations that are applicable to the proposed Project. Applicable General Plan policies relating to archeological, historic, and paleontological resources are identified in Section V, Cultural Resources of this IS/MND.

Explanation of Checklist Answers

Would the Project:

a) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

   i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k)?

   ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in subdivision (c) of Public Resources Code Section 5024.1. In applying the criteria set forth in subdivision (c) of Public Resources Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe?

Less than Significant Impact with Mitigation Incorporated. As stated in item V.b above, the general vicinity of the Project site is known to have been occupied by the Luiseño, Cahuilla, and other native people for thousands of years. The EIC record search indicated that 19 cultural resources have been recorded within a mile of the Project site. However, the Project site itself had not been previously surveyed, thus, there were no previously recorded resources located within the Project boundaries. HELIX staff conducted a field survey as part of the Project (see Section V, Cultural Resources and Appendix C of this IS/MND), no resources were identified. Regardless of negative results, there is the possibility that resources could be unearthed during clearing and grading. Potential unknown impacts would be mitigated to less than significant with the incorporation of MM CUL-1 and MM CUL-2.

In accordance with the requirements of AB 52, on November 12, 2019 notification letters regarding the Project were sent to Native American Tribes traditionally and culturally affiliated with the Project area. In a response dated November 21, 2019, the Morongo Tribe of Indians stated that their tribe had no comments. HELIX contacted the NAHC on December 11, 2019 for a SLF search and list of Native American contacts for the Project area. The NAHC indicated in a response dated December 19, 2019 that no known sacred lands or Native American cultural resources are within the Project area. Letters were sent on December 24, 2019 to Native American representatives and interested parties identified by the NAHC. In a response dated January 9, 2020, the Agua Caliente Band of Cahuilla Indians (ACBCI) stated that although the Project is not located within the ACBCI Reservation, it is within the Tribe’s Traditional Use Area. As such, the Tribe requests a thorough description of the Project, copies of any cultural resource documentation generated in connection to the Project, and a copy of the records search with associated survey reports and site records from the information center. Additionally, in a response dated January 9, 2020, the Cahuilla Band of Indians stated that although the Project is not located within the Cahuilla Reservation, the site is within the Cahuilla Traditional Use Area. Therefore, the Tribe requests tribal monitors from Cahuilla be present during all ground disturbing activities and to be notified of all future Project updates. If any additional responses are received, they will be forwarded to City staff. Native American correspondence is included as Appendix C (Confidential Appendices, bound separately) of the Cultural Resources Survey, which is Appendix C of this IS/MND. However, due to the cultural sensitivity of the area, mitigation measures proposed in Section V of this IS/MND would reduce potential impacts to tribal cultural resources to a less than significant level.

Mitigation Measure(s)

With implementation of mitigation measures MM CUL-1 and MM CUL-2 discussed in item V above, impacts related to tribal cultural resources would be less than significant. No additional mitigation measures are required.

XIX. UTILITIES AND SERVICE SYSTEMS

		Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:					
a)	Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?	☐	☐	■	☐
b)	Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?	☐	☐	■	☐
c)	Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	☐	☐	■	☐
d)	Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?	☐	☐	☐	■
e)	Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?	☐	☐	☐	■

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris Municipal Code Section 7.44.050

Section 7.44.050 of the city of Perris Municipal Code outlines the requirements for the diversion of construction waste. Unless exempt, an applicant shall divert or cause to be diverted 50 percent of the construction and demolition materials resulting from a project.

City of Perris Municipal Code Section 7.44.060

Section 7.44.060 of the city of Perris Municipal Code requires the submission of a waste management plan that will outline the estimated type, volume and weight of construction material to be diverted and the method of diversion.

Explanation of Checklist Answers

Would the Project:

a) Require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects?

Less than Significant Impact. The proposed Project involves the construction of a park, which as noted previously is not anticipated to result in the addition of any new residents to the area. The Project would require minimal amounts of water and wastewater treatment to support the proposed splash pad, landscaping, and bathroom facilities. The splash pad would use reclaimed water and as is typical of other types of water play features at similar parks, the water would not be constantly flowing. Splash pad users would activate water use on demand. Moreover, site landscaping would be limited as the existing riparian and biologically sensitive areas would remain undeveloped and any project-related landscaping would be drought tolerant. Similar to the splash pad, the multi-use field would use reclaimed water for irrigation. Restroom fixtures would be Title 24 compliant, which would require that all faucets and toilets be low flow. The Project would require local connections to connect to the surrounding water and wastewater infrastructure that serves the greater Project area. Thus, with the project-related design features coupled with the required compliance with regulations for energy efficiency, the Project would not substantially increase the demand for wastewater treatment services and would not require the need for new or expanded water or wastewater treatment facilities. Adequate services and utilities infrastructure are available to serve the Project. Implementation of the Project would not require the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities. Impacts associated with these utilities would be less than significant.

<u>Mitigation Measure(s)</u>

No mitigation measures are required.

b) Have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years?

Less than Significant Impact. The proposed Project would result in a slight increase in water demand to accommodate the bathroom facility needs for park visitors. Water demands for landscaping purposes would be minimal as a portion of the Project site would remain in its current natural state and any ornamental landscaping would be drought tolerant. Reclaimed water would be used to irrigate the multi-use field and for the splash pad. Conservatively, not accounting for any of these project design features, the Project would use 26.21 million gallons per year. Yet with a portion of the site to remain in its current state (72 percent), which would not be irrigated and the remaining portions of the site to be developed with the park features and drought tolerant landscaping, the actual water use would be lower. Moreover, any irrigation for landscaping would be from reclaimed water that would not place a demand on potable water. Thus, the primary uses of potable water would be the restroom facilities and any water fountains that may be installed at the site These facilities, as required by CALGreen, would include low flow faucets and toilets. Therefore, due to the low demand and the required compliance to State efficiency standards, the Project would have sufficient water supplies available to serve the Project and reasonably foreseeable future development during normal, dry and multiple dry years. Impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

c) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Less than Significant Impact. The Project would generate wastewater (sewage) from visitors to the park using the restroom facilities. Onsite wastewater infrastructure would require local connections to the surrounding infrastructure. Considering that the Project site is designated for residential uses in the General Plan, it is reasonable to anticipate that the City has adequate capacity to serve the proposed park use would likely generate a lower amount of wastewater than the 159 single-family homes that could be allowed to be developed on the site. As stated in item XIX.a above, the wastewater treatment provider is anticipated to have adequate capacity to serve the Project's minimal demand in addition to the provider's existing commitments. Impacts would be less than significant in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

d) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals?

Less than Significant Impact. California Department of Resources and Recycling and Recovery (CalRecycle) monitor the progress of local jurisdictions in meeting the various solid waste reduction recycling goals, which are expressed in per capita disposal rates for residents and employees. The most current information for the City of Perris (2018) is that the City is disposing fewer pounds per day (ppd) of waste than the target rates; thereby exceeding their goal. Specifically, the city of Perris has a goal of disposing of no more than 6.30 ppd/resident and 20.60 ppd/employee; as of 2018, on the whole residents were disposing of 5.10 ppd and employees 19.90 ppd (CalRecycle 2020).

The Project would create solid waste during both construction and operation. During construction the Project would be required to adhere to the City's Municipal Code and divert a minimum of 50 percent of the waste and the City would be required to create a waste management plan to be reviewed and approved by the City's Public Works Department, prior to the issuance of permits. CR&R provide waste services to the City of Perris. During the operation of the park, waste typical of a parkland use would be generated, including food packaging, paper, pet waste, etc. Trash and separate recycling receptacles would be placed throughout the park and collected in accordance with the provisions set forth in the City of Perris Municipal Code Chapter 17, Rubbish Collection and Disposal. The amount of waste produced by park users would differ depending on the level of use and day of the week. For example, larger amounts of waste would likely be generated during weekends or if sporting events are held at the multi-use field. Given that the only solid waste generated from the park would be from visitors and the Project would not include any residential uses or include permanent employees on the site, it is not anticipated that the Project would impede goals that the City has established for residents and employees. Therefore, the Project would have a less than significant impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

e) Comply with federal, state, and local management and reduction statutes and regulations related to solid waste?

Less than Significant Impact. The Project would comply as required with the City's solid waste reduction programs, which are designed to comply with federal, state, and local statutes and regulations related to solid waste. These statutes and regulations include the California Integrated Solid Waste Management Act, the California Beverage Container Recycling and Litter Reduction Act, and the City's solid waste disposal policies and practices. The Integrated Solid Waste Management Act requires that jurisdictions maintain a 50 percent or better diversion rate for solid waste, including construction and demolition waste. Therefore, the Project would have a less than significant impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

XX. WILDFIRE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
If located in or near state responsibility areas or lands classified as very high fire hazard severity zones, would the project:				
a) Substantially impair an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	■
b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?	☐	☐	■	☐
c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?	☐	☐	☐	■
d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?	☐	☐	☐	■

Applicable General Plan Policies, Ordinances, and Regulations

City of Perris Municipal Code Section 10.12.100

Section 10.12.100, Detours and Construction, of the City of Perris Municipal Codes identifies that no street shall be closed or partially obstructed, or detours established, without approval of the City's traffic engineer.

City of Perris General Plan Safety Element Policy III.B

Policy III.B The City will develop and maintain a disaster response and evacuation plan.

Explanation of Checklist Answers

Would the Project:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan?

No Impact. The City has an Emergency Operations Plan, which is a document that establishes the framework for the City's compliance with the California Standardized Emergency Management System and is a participant with other local jurisdictions in a Local Hazard Mitigation Plan; neither plan outlines an established evacuation route(s) in the City. Policy III.B of the Safety Element of the City of Perris General Plan states that the City will develop and maintain a disaster response and evacuation plan; however, this plan how not yet been created. During construction the Project would be required to comply with City of Perris Municipal Code Section 10.12.100, which identifies that no street shall be closed or partially obstructed, or detours established, without approval of the City's traffic engineer.

Project implementation does not include altering any existing roadways, with the exception of improving Weston Road and Metz Road in accordance with the City's planned specifications for these roadways. The Project would incorporate three ingress/egress drives along the northern and southern perimeter. Given that the City has not yet adopted an emergency response plan or emergency evacuation plan, none of the roadways surrounding the Project site are designated as an evacuation route. As such, it is not anticipated that implementation of the proposed Project would interfere with an adopted emergency response plan or emergency evacuation plan and there would be no impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire?

Less than Significant Impact. In the City of Perris General Plan, the Project site is not classified as a Wildfire Hazard Area (City 2005). However, in the VHFHSZ for Local Responsibility Area map for the City of Perris, CAL FIRE classifies the Project site as a VHFHSZ (CAL FIRE 2009). Yet, implementation of the proposed Project would not heighten wildfire risks. Currently, the Project site is primarily undeveloped, with the exception of some trails, a BMX course, and other manmade features. The lot also includes vegetation and debris and is surrounded by urban uses. The proposed Project involves the construction of a park that includes a multi-use field, play areas, restroom buildings, parking lots, trails, a splash play, a skate spot, a zip line, and other recreational uses that do not exacerbate current wildfire risks. Additionally, the proposed Project would incorporate fire prevention measures outlined in the City of Perris General Plan, CBC, and California Fire Code. Therefore, the proposed Project would not exacerbate wildfire risks due to slope, prevailing winds, and other factors, and impacts related to exposing Project occupants to pollutant concentrations from a wildfire or the uncontrolled spread of a wildfire would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment?

No Impact. The proposed Project is a park and does not include the installation of infrastructure that would exacerbate fire risks. The Project would be required to comply with the California Fire Code (City of Perris Municipal Code Section 16.08.058), which stipulates the standards for access, fire hydrants, water pressure, fire lanes, etc. The Project would remove fire hazards such as overgrown brush and vegetation and large debris piles. Therefore, the Project would have no impact in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes?

Less than Significant Impact. As discussed in Section VII, Geology and Soils, of this IS/MND, the Project site is relatively flat with little topographic variation. Additionally, the Project site and surrounding area are not identified as being within an area subject to landslides (City 2005). As stated in item X.c.i of this IS/MND, the incorporation of impervious surfaces introduced by the Project would be minimal, as approximately 72 percent of the site would remain in a natural condition. Additionally, the on-site drainage patterns would not be significantly changed from current conditions. The existing drainage points for the site would be retained, and the amount of water discharge from the site would be similar to existing conditions through the incorporation of a bioretention basin that is designed to function as a combined water quality/detention basin. Therefore, there would not be significant impacts related to runoff, post-fire slope instability, or drainage changes for the site, and impacts would be less than significant.

Mitigation Measure(s)

No mitigation measures are required.

XXI. MANDATORY FINDINGS OF SIGNIFICANCE

	Potentially Significant Impact	Less Than Significant with Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	☐	■	☐	☐
b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present and probable future projects)?	☐	☐	■	☐
c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?	☐	■	☐	☐

Applicable General Plan Policies, Ordinances, and Regulations

Please see the applicable General Plan Policies, Ordinances, and Regulations as identified in issue Sections I-XX of this IS/MND.

Explanation of Checklist Answers

a) Does the project have the potential to substantially degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, substantially reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Less than Significant Impact with Mitigation Incorporated. As discussed in Section IV, Biological Resources, the Project would have a less than significant impact to the paniculate tarplant located onsite given that it is an isolated population and there is higher quality habitat located north of the site. Similarly, while a single Cooper's hawk was observed at the Project site and the site has the potential to provide foraging and nesting habitat, higher quality habitat is located 300 feet north of the site at the Motte Rimrock Reserve. Mitigation Measures BIO-1 and BIO-2 would be incorporated into the Project, additionally reducing these potential biological resources impacts to less than significant. Likewise, potential significant indirect impacts could occur if stormwater runoff is not controlled at the construction site, and sediment, toxics, and/or other material are inadvertently carried into sensitive habitat within the mule fat scrub or tamarisk scrub east of the impact area. Furthermore, if the construction work areas are not properly fenced, inadvertent encroachment into adjacent sensitive riparian habitat could occur. Mitigation measure BIO-3 has been incorporated into the Project, reducing this impact to less than significant.

Section V, Cultural Resources, discusses the potential impact to historic and prehistoric resources. While the literature review, survey, and general knowledge of the Project area indicate that the presence of resources is low, mitigation measures (MM CUL-1 and MM CUL-2) are incorporated into the Project to reduce potential impacts to a level that is less than significant.

Mitigation Measure(s)

See MM BIO-1, MM BIO-2, and MM BIO-3 in Section IV, Biological Resources and MM CUL-1 and MM CUL-2 of Section V, Cultural Resources.

b) Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of past, present and probable future projects)?

Less than Significant Impact. Often cumulative impacts are associated with features of a project that would directly induce growth (new housing) or indirectly induce growth (extension of services or employment opportunities). The Project is a park in an area that is currently park deficient and would not directly or indirectly induce growth in the area.

As discussed in Section III, Air Quality, long-term Project operation would not result in a regional cumulatively considerable net increase of any criteria pollutant criteria pollutant emissions. Similarly, the Project would have a less than significant impact in relation to GHG, which is inherently discussed in terms of a cumulative impacts. Conservatively, impacts related to cultural resources were determined to be potentially significant in the event that, yet unknown and unanticipated resources are unearthed during clearing and grading activities. Impacts related to biological resources would occur in the event that construction activities occur during the nesting season or in the event that onsite burrows provide habitat for burrowing owls (although none were identified on site). Noise impacts are related to short-term construction in the event that rock breaking is proposed. Likewise, estimated vehicle trips are low, and it is likely that some trips are captured from residents that would have otherwise traveled elsewhere to recreate. The City of Perris has a map of projects that are under review, approved, and under construction; none of which are in proximity to the proposed Project (City 2020). There are no known cumulative Projects occurring in the Project area and it is unlikely that combined with other Projects that implementation of the Enchanted Hills Park would contribute to a significant cumulative impact. Impacts are less than significant in relation to this issue.

Mitigation Measure(s)

No mitigation measures are required.

c) Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly?

Less than Significant Impact with Mitigation Incorporated. The air quality analysis summarized in Section III, Air Quality and included as Appendix A of this IS/MND identified that the Project would have less than significant impacts in relation to toxic air contaminants and other air quality health concerns. Other issue areas that could potentially create substantial adverse effects on human beings such as hazardous materials or waste, risk of fire or floods, and operational noise were determined to be less than significant. Thus, there would be no long-term operation impacts in relation to this issue. It is noted that temporary construction noise as discussed in Section XIII, Noise, of this IS/MND has the potential if left unmitigated to have a significant impact. However, MM NOI-1 reduces the level to less than significant.

Mitigation Measure(s)

See MM-NOI-1. No additional mitigation measures are required.

4.0 REFERENCES

California Air Resources Board (CARB). 2005. Air Quality and Land Use Handbook: A Community Health Perspective. November. Available at: https://www.arb.ca.gov/ch/handbook.pdf.

California Department of Conservation. 2016. Farmland Mapping and Monitoring Program. California Important Farmland Finder.

California Department of Forestry and Fire Protection (CAL FIRE). 2009. Very High Fire Hazard Severity Zones in Local Responsibility Area. December 21.

California Department of Resources and Recycling and Recovery (CalRecycle). 2020. Jurisdiction Diversion/Disposal Rate Summary. January 9. Available from: https://www2.calrecycle.ca.gov/LGCentral/DiversionProgram/JurisdictionDiversionPost2006.

California Department of Transportation (Caltrans). 2013. Transportation and Construction Vibration Guidance Manual. September.

CValdo. 2020a. Project Specific Water Quality Management Plan. January 10.

2020b. 100% Submittal Enchanted Hills Park Drainage Study. January 10.

Federal Emergency Management Agency (FEMA). 2008. FEMA Flood Map Service Center. August 28. Available from: https://msc.fema.gov/portal/home.

HELIX Environmental Planning, Inc. (HELIX). 2020a. Air Quality and Greenhouse Gas Emissions Technical Report. December.

2020b. Cultural Resources Survey. January.

2019a. Biological Resources Letter Report for the Enchanted Hills Park Project. December 23.

2019b. Enchanted Hills Park Project – Noise Analysis. December 23.

Mead and Hunt. 2014. March Air Reserve Base/Inland Port Airport Land Use Compatibility Plan. November 13.

Natural Resources Conservation Service. 2019. *Web Soil Survey*. United States Department of Agriculture. Electronic document available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx. Accessed November 2019.

Paleo Solutions, Inc. 2020. Paleontological Technical Study Enchanted Hills Park Skate Spot Project, City of Perris, Riverside County, California. January.

Perris, City of (City). 2020. Current Project Map. January 10.

2016. Zoning Map. October.

2013. General Plan Map. January 3.

2005. City of Perris General Plan.

Riverside County. 2015. Noise Element. County of Riverside General Plan. December 8.

2010. Initial Study and Negative Declaration: Airport Land Use Compatibility Plan for Perris Valley Airport. October.

2006. Burrowing Owl Survey Instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area. Environmental Programs Department. Retrieved from: http://rctlma.org/Portals/1/EPD/consultant/burrowing_owl_survey_instructions.pdf. March 29.

South Coast Air Quality Management District (SCAQMD). 2010. Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group Meeting #15 (slide presentation). Diamond Bar, CA. SCAQMD. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqasignificance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-mainpresentation.pdf. September 28.

2009. Mass Rate Localized Significance Thresholds Look-up Tables. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/appendix-c-mass-rate-lst-look-up-tables.pdf?sfvrsn=2. October.

Urban Crossroads, Inc. 2019. Enchanted Hills Park Focused Traffic Assessment. December 13.

U.S. Department of Transportation (USDOT). 2008. Roadway Construction Noise Model (RCNM).

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Appendix A

Air Quality and Green House Gas Emissions Technical Report

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Enchanted Hills Park Project

Air Quality and Greenhouse Gas Emissions Technical Report

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ACRONYMS AND ABBREVIATIONS

$\mu g/m^3$	micrograms per cubic meter
AB	Assembly Bill
APCD	Air Pollution Control District
AQMP	Air Quality Management Plan
BACM	Best Available Control Measures
C_2F_6	hexafluoroethane
CAA	Clean Air Act
CAAQS	California Ambient Air Quality Standards
CAFE	Corporate Average Fuel Economy
CalEEMod	California Emissions Estimator Model
CalEPA	California Environmental Protection Agency
CALGreen	California Green Building Standards Code
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CAP	Climate Action Plan
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CBSC	California Building Standards Commission
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CF_4	tetraflouromethane
CFC	chlorofluorocarbon
CH_4	methane
City	City of Perris
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
County	County of Riverside
DPM	diesel particulate matter
EO	Executive Order
F	Fahrenheit
GHG	greenhouse gas
GWP	global warming potential

H_2S	hydrogen sulfide
HAP	Hazardous Air Pollutant
HFC	hydrofluorocarbon
HRA	health risk assessment
IPCC	Intergovernmental Panel on Climate Change
LCFS	Low Carbon Fuel Standard
LOS	level of service
LST	localized significance threshold
mg/m^3	milligrams per cubic meter
MMT	million metric tons
mpg	miles per gallon
MPO	Metropolitan Planning Organization
MT	metric ton
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NHTSA	National Highway Traffic Safety Administration
NO_2	nitrogen dioxide
NOAA	National Oceanic and Atmospheric Administration
NO_X	nitrogen oxides
O_3	ozone
OPR	Governor's Office of Planning and Research
Pb	lead
PFC	perfluorocarbon
PM	particulate matter
PM_{10}	particulate matter less than 10 microns
$PM_{2.5}$	particulate matter less than 2.5 microns
ppm	parts per million
ROG	reactive organic gas
RTP	Regional Transportation Plan

ACRONYMS AND ABBREVIATIONS (cont.)

SB	Senate Bill
SCAB	South Coast Air Basin
SCAG	Southern California Association of Governments
SCAQMD	South Coast Air Quality Management District
SCS	Sustainable Communities Strategy
SF_6	hexafluoride
SIP	State Implementation Plan
SO_2	sulfur dioxide
SO_X	sulfur oxides
SRA	source receptor area
TACs	toxic air contaminants
USEPA	U.S. Environmental Protection Agency
VMT	vehicle miles traveled
VOC	volatile organic compound
WRCC	Western Regional Climate Center
WRCOG	Western Riverside Council of Governments

EXECUTIVE SUMMARY

This report assesses potential air quality and greenhouse gas (GHG) emission impacts during construction and operation of the proposed Enchanted Hills Park Project (Project), located east of Carter Drive, north of Weston Road, west of Altura Drive, and south of West Metz Road, in the city of Perris (City). The proposed Project involves the construction of a park with a combination of passive and active recreational features on a predominately undeveloped 22-acre site. The park would include a multi-use field, child play area, toddler play area, restrooms, picnic shelters, hardscape, parking lots, bridges, trails, a basketball court, BMX course improvements, art rocks, splash play, a skating area, an adventure play, and a zip line.

The Project would result in emissions of criteria air pollutants during construction and operation. Construction emissions would include fugitive dust, heavy construction equipment exhaust, and vehicle exhaust associated with workers commuting to and from the site and trucks hauling materials. To account for the requirements of South Coast Air Quality Management District (SCAQMD) Rule 403, fugitive dust control measures including the use of an on-site water truck to wet down active grading areas and roads at least twice daily are incorporated into the Project design. Operational sources of criteria pollutant emissions include area and transportation. Project emissions of criteria pollutants during construction and operation of the proposed park would remain below SCAQMD emissions thresholds.

The Project would be consistent with air quality policies set forth by the SCAQMD as presented in the most recent Air Quality Management Plan.

Project-generated traffic would not result in a carbon monoxide hot spot. Construction and operation of the Project would not result in exposure of sensitive receptors to significant quantities of toxic air contaminants. In addition, evaluation of potential odors from the Project indicated that associated impacts would be less than significant.

Construction sources of GHG emissions include heavy construction equipment, worker vehicle miles traveled (VMT), and water use. Operational sources of GHG emissions include area, energy, transportation, water use, and solid waste. The Project-related construction activities are estimated to generate 1,362 metric tons (MT) of carbon dioxide equivalent (CO_2e). Construction emissions are amortized over 30 years, such that the proposed construction activities would contribute an average of 45 MT per year of CO_2e emissions. The Project-related operational and amortized construction GHG emissions for opening year are estimated to generate 386 MT CO_2e. Project emissions would not exceed the SCAQMD GHG screening threshold of 2,709 MT CO_2e adjusted for compliance with Senate Bill (SB) 32. The Project would be consistent with SB 32, the Western Riverside Council of Governments (WRCOG) Subregional Climate Action Plan (CAP), and the City's CAP and would result in a less than significant impact related to GHG emissions.

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1.0 INTRODUCTION

1.1 PURPOSE OF THE REPORT

This report analyzes potential air quality and greenhouse gas (GHG) emissions impacts associated with the proposed Enchanted Hills Park Project (Project). The analysis includes a description of existing conditions in the Project vicinity, an assessment of potential impacts associated with Project specific construction activities and long-term operation, and an assessment of potential health risks and objectionable odors. Analysis within this report for both air quality and GHG emissions addresses the relevant issues listed in Appendix G of the California Environmental Quality Act (CEQA) Guidelines.

1.2 PROJECT LOCATION

The Project site is located on an approximately 22-acre undeveloped site in Perris, California. The site is immediately bordered by West Metz Road to the north, Weston Road to the south, and single-family residences to the west and east. See Figure 1, *Regional Location*, and Figure 2, *Aerial Photograph.*

1.3 PROJECT DESCRIPTION

The proposed Project involves the construction of a park with a combination of passive and active recreational features. The park would include a multi-use field, child play area, toddler play area, restrooms, picnic shelters, hardscape, parking lots, bridges, trails, a basketball court, BMX course improvements, art rocks, splash play, a skating area, an adventure play, and a zip line (see Figure 3, *Conceptual Site Plan*).The Project would retain and incorporate some of the existing site features, such as Owl Rock, which is a painted boulder, and the existing BMX course.

1.4 CONSTRUCTION ACTIVITIES AND PHASING

Project construction is anticipated to begin in September 2020 and be completed in November 2021. Construction activities would include site preparation, grading, construction of structures, paving of the parking lots and driveways, and the application of architectural coatings. Grading is assumed to require up to 11,200 cubic yards of soil hauling. Detailed construction phasing and equipment assumptions are included in Section 4.1, below, and the California Emissions Estimator Model (CalEEMod) output files in Appendix A.

2.0 REGULATORY SETTING

2.1 AIR QUALITY

2.1.1 Criteria Pollutants

Six air pollutants have been identified by the U.S. Environmental Protection Agency (USEPA) and the California Air Resources Board (CARB) as being of concern both on a nationwide and statewide level: ground-level ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), lead, and particulate matter (PM), which is subdivided into two classes based on particle size: coarse PM equal to or less than 10 micrometers in diameter (PM_{10}) and fine PM equal to or less than 2.5 micrometers in diameter ($PM_{2.5}$). These air pollutants are commonly referred to as "criteria air pollutants" because air quality standards are regulated using human health and environmentally based criteria. Criteria pollutants can be emitted directly from sources (primary pollutants; e.g., CO, SO_2, PM_{10}, $PM_{2.5}$, and lead), or they may be formed through chemical and photochemical reactions of precursor pollutants (secondary pollutants; e.g., ozone, NO_2, PM_{10}, and $PM_{2.5}$) in the atmosphere. PM_{10} and $PM_{2.5}$ can be both primary pollutants emitted directly from a source and secondary pollutants formed through chemical reactions in the atmosphere. The principal precursor pollutants of concern are reactive organic gasses ([ROGs] also known as volatile organic compounds [VOCs])[1] and nitrogen oxides (NO_X).

The descriptions of sources and general health effects for each of the criteria air pollutants are shown in Table 1, *Summary of Common Sources and Human Health Effects of Criteria Air Pollutants,* based on information provided by the California Air Pollution Control Officers Association ([CAPCOA] 2019). Specific adverse health effects to individuals or population groups induced by criteria pollutant emissions are highly dependent on a multitude of interconnected variables (e.g., cumulative concentrations, local meteorology and atmospheric conditions, and the number and character of exposed individuals [e.g., age, gender]). Criteria pollutant precursors (ROG and NO_X) affect air quality on a regional scale, typically after significant delay and distance from the pollutant source emissions. Health effects related to ozone and NO_2 are, therefore, the product of emissions generated by numerous sources throughout a region. As such, specific health effects from these criteria pollutant emissions cannot be directly correlated to the incremental contribution from a single project.

Other pollutants known as GHGs (e.g., carbon dioxide [CO_2]), have been linked to climate change. Unlike criteria air pollutants, there are no regulated concentration limits for GHGs. However, Assembly Bill (AB) 32 and Senate Bill (SB) 32 require the state to reduce GHG emissions, as discussed further in Section 2.2, *Greenhouse Gases*. GHG emissions do not jeopardize the air basin's air quality attainment status.

Table 1
SUMMARY OF COMMON SOURCES AND HUMAN HEALTH EFFECTS OF CRITERIA AIR POLLUTANTS

Pollutant	Major Man-Made Sources	Human Health Effects
Carbon Monoxide (CO)	An odorless, colorless gas formed when carbon in fuel is not burned completely; a component of motor vehicle exhaust.	Reduces the ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Impairs vision, causes dizziness, and can lead to unconsciousness or death.
Nitrogen Dioxide (NO_2)	A reddish-brown gas formed during fuel combustion for motor vehicles and industrial sources. Sources include motor vehicles, electric utilities, and other sources that burn fuel.	Respiratory irritant; aggravates lung and heart problems. Precursor to ozone and acid rain. Contributes to climate change and nutrient overloading which deteriorates water quality. Causes brown discoloration of the atmosphere.

[1] CARB defines and uses the term ROGs while the USEPA defines and uses the term VOCs. The compounds included in the lists of ROGs and VOCs and the methods of calculation are slightly different. However, for the purposes of estimating criteria pollutant precursor emissions, the two terms are often used interchangeably.

Table 1 (cont.)
SUMMARY OF COMMON SOURCES AND HUMAN HEALTH EFFECTS OF CRITERIA AIR POLLUTANTS

Pollutant	Major Man-Made Sources	Human Health Effects
Ozone (O_3)	Formed by a chemical reaction between reactive organic gases (ROGs) and nitrogen oxides (NO_X) in the presence of sunlight. Common sources of these precursor pollutants include motor vehicle exhaust, industrial emissions, gasoline storage and transport, solvents, paints, and landfills.	Irritates and causes inflammation of the mucous membranes and lung airways; causes wheezing, coughing, and pain when inhaling deeply; decreases lung capacity; aggravates lung and heart problems. Damages plants; reduces crop yield. Damages rubber, some textiles and dyes.
Particulate Matter (PM_{10} and $PM_{2.5}$)	Produced by power plants, steel mills, chemical plants, unpaved roads and parking lots, wood-burning stoves and fireplaces, automobiles, and other sources.	Increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease. Impairs visibility (haze).
Sulfur Dioxide (SO_2)	A colorless, nonflammable gas formed when fuel containing sulfur is burned, when gasoline is extracted from oil, or when metal is extracted from ore. Examples are petroleum refineries, cement manufacturing, metal processing facilities, locomotives, and ships.	Respiratory irritant. Aggravates lung and heart problems. In the presence of moisture and oxygen, sulfur dioxide converts to sulfuric acid which can damage marble, iron and steel. Damages crops and natural vegetation. Impairs visibility. Precursor to acid rain.
Lead	Metallic element emitted from metal refineries, smelters, battery manufacturers, iron and steel producers, use of leaded fuels by racing and aircraft industries.	Anemia, high blood pressure, brain and kidney damage, neurological disorders, cancer, lowered IQ. Affects animals, plants, and aquatic ecosystems.

Source: CAPCOA 2019

2.1.2 Toxic Air Contaminants

Toxic air contaminants (TACs) are a diverse group of air pollutants that may cause or contribute to an increase in deaths or in serious illness or that may pose a present or potential hazard to human health. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage, or short-term acute effects such as eye watering, respiratory irritation (a cough), runny nose, throat pain, and headaches. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For carcinogenic TACs, there is no level of exposure that is considered safe and impacts are evaluated in terms of overall relative risk expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

2.1.3 Federal Air Quality Regulations

2.1.3.1 Federal Clean Air Act

Air quality is defined by ambient air concentrations of specific pollutants identified by the USEPA to be of concern with respect to health and welfare of the public. The USEPA is responsible for enforcing the Federal Clean Air Act (CAA), first enacted in 1963 and amended numerous times in subsequent years (1965, 1967, 1970, 1977, and 1990). The CAA mandates the USEPA to establish National Ambient Air Quality Standards (NAAQS), which identify concentrations of pollutants in the ambient air below which no adverse effects on the public health and welfare are anticipated. In response, the USEPA established both primary and secondary standards for several criteria pollutants, which are introduced above. Table 2, *Ambient Air Quality Standards*, shows the federal and state ambient air quality standards for these pollutants.

Table 2
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary[1]	Secondary[2]
O_3	1 Hour	0.09 ppm (180 µg/m^3)	–	–
	8 Hour	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	Same as Primary
PM_{10}	24 Hour	50 µg/m^3	150 µg/m^3	Same as Primary
	AAM	20 µg/m^3	–	Same as Primary
$PM_{2.5}$	24 Hour	–	35 µg/m^3	Same as Primary
	AAM	12 µg/m^3	12.0 µg/m^3	15.0 µg/m^3
CO	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	–
	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)	–
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m^3)	–	–
NO_2	1 Hour	0.18 ppm (339 µg/m^3)	0.100 ppm (188 µg/m^3)	–
	AAM	0.030 ppm (57 µg/m^3)	0.053 ppm (100 µg/m^3)	Same as Primary
SO_2	1 Hour	0.25 ppm (655 µg/m^3)	0.075 ppm (196 µg/m^3)	–
	3 Hour	–	–	0.5 ppm (1,300 µg/m^3)
	24 Hour	0.04 ppm (105 µg/m^3)	–	–
Lead	30-day Avg.	1.5 µg/m^3	–	–
	Calendar Quarter	–	1.5 µg/m^3	Same as Primary
	Rolling 3-month Avg.	–	0.15 µg/m^3	

Table 2 (cont.)
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards	Federal Standards	
			Primary[1]	Secondary[2]
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per km – visibility ≥ 10 miles (0.07 per km – ≥30 miles for Lake Tahoe)	**No Federal Standards**	
Sulfates	24 Hour	25 µg/m^3		
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)		
Vinyl Chloride	24 Hour	0.01 ppm (26 µg/m^3)		

Source: CARB 2016

1 National Primary Standards: The levels of air quality necessary, within an adequate margin of safety, to protect the public health.

2 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

AAM: Annual Arithmetic Mean; CO: carbon monoxide; km: kilometer; mg/m^3: milligrams per cubic meter; NO_2 nitrogen dioxide; O_3: ozone; ppm: parts per million; PM_{10}: coarse particulate matter with an aerodynamic diameter of 10 microns or less; $PM_{2.5}$: fine particulate matter with an aerodynamic diameter of 2.5 microns or less; SO_2: sulfur dioxide; –: No Standard; µg/m^3: micrograms per cubic meter

The CAA allows states to adopt ambient air quality standards and other regulations provided they are at least as stringent as federal standards. CARB has established the more stringent California Ambient Air Quality Standards (CAAQS) for the six criteria pollutants described in Table 1 through the California Clean Air Act of 1988, and also has established CAAQS for additional pollutants, including sulfates, hydrogen sulfide (H_2S), vinyl chloride, and visibility-reducing particles. Areas that do not meet the NAAQS or the CAAQS for a particular pollutant are considered to be “nonattainment areas” for that pollutant.

The USEPA has classified air basins (or portions thereof) as being in “attainment,” “nonattainment,” or “unclassified” for each criteria air pollutant, based on whether or not the NAAQS have been achieved. If an area is designated unclassified, it is because inadequate air quality data were available as a basis for a nonattainment or attainment designation. The Project site is located within the South Coast Air Basin (SCAB) and, as such, is in an area designated a nonattainment area for certain pollutants that are regulated under the CAA. Table 3 of Section 2.1.5.1, *South Coast Air Basin Attainment Status*, lists the federal and state attainment status of the SCAB for the criteria pollutants. The USEPA classifies the SCAB as in attainment for CO, PM_{10}, NO_2, SO_2, and lead; in extreme nonattainment for 8-hour ozone; and in serious nonattainment for $PM_{2.5}$ with respect to federal air quality standards.

The CAA (and its subsequent amendments) requires each state to prepare an air quality control plan referred to as the State Implementation Plan (SIP). The CAA Amendments dictate that states containing areas violating the NAAQS revise their SIPs to include extra control measures to reduce air pollution. The SIP includes strategies and control measures to attain the NAAQS by deadlines established by the CAA. The SIP is periodically modified to reflect the latest emissions inventories, plans, and rules and regulations of air basins as reported by the agencies with jurisdiction over them. The USEPA has the responsibility to review all SIPs to determine whether they conform to the requirements of the CAA.

2.1.4 California Air Quality Regulations

2.1.4.1 California Clean Air Act

The federal CAA allows states to adopt ambient air quality standards and other regulations provided that they are at least as stringent as federal standards. CARB, a part of the California EPA (CalEPA), is responsible for the coordination and administration of both federal and state air pollution control programs within California, including setting the CAAQS. CARB also conducts research, compiles emission inventories, develops suggested control measures, and provides oversight of local programs. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hairspray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions. CARB also has primary responsibility for the development of California's SIP, for which it works closely with the federal government and the local air districts.

Table 3 lists the state attainment status of the SCAB for the criteria pollutants. Under state designation, the SCAB is currently in attainment for CO, NO_2, SO_2, and lead; and in nonattainment for ozone, PM_{10}, and $PM_{2.5}$.

2.1.4.2 Toxic Air Contaminants

California's air toxics control program began in 1983 with the passage of the Toxic Air Contaminant Identification and Control Act, better known as AB 1807 or the Tanner Bill. When a compound becomes listed as a TAC under the Tanner process, CARB normally establishes minimum statewide emission control measures to be adopted by local air pollution control districts (APCDs). Later legislative amendments (AB 2728) required CARB to incorporate all 189 federal hazardous air pollutants (HAPs) into the state list of TACs.

Supplementing the Tanner process, AB 2588 – the Air Toxics "Hot Spots" Information and Assessment Act of 1987 – currently regulates over 600 air compounds, including all of the Tanner-designated TACs. Under AB 2588, specified facilities must quantify emissions of regulated air toxics and report them to the local APCD. If the APCD determines that a potentially significant public health risk is posed by a given facility, the facility is required to perform a health risk assessment (HRA) and notify the public in the affected area if the calculated risks exceed specified criteria.

Diesel engines emit a complex mixture of air pollutants, including both gaseous and solid material. The solid material in diesel exhaust is known as diesel particulate matter (DPM). Almost all DPM is 10 microns or less in diameter, and 90 percent of DPM is less than 2.5 microns in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung. In 1998, the CARB identified DPM as a toxic air contaminant based on published evidence of a relationship between diesel exhaust exposure and lung cancer and other adverse health effects. DPM has a significant impact on California's population—it is estimated that about 70 percent of total known cancer risk related to air toxics in California is attributable to DPM (CARB 2018).

In September 2000, CARB approved the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (Diesel Risk Reduction Plan; CARB 2000). The Diesel Risk Reduction Plan outlined a comprehensive and ambitious program that included the development of numerous new control measures over the next several years aimed at substantially reducing emissions from new and existing on-road vehicles (e.g., heavy-duty trucks and buses), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps), and stationary engines (e.g., stand-by power generators). These requirements are now in force on a statewide basis.

2.1.5 Local Regulations

2.1.5.1 South Coast Air Quality Management District

The Project is located in western Riverside County (County). Air quality in the western portion of the County is regulated by the South Coast Air Quality Management District (SCAQMD). As a regional agency, the SCAQMD works directly with the Southern California Association of Governments (SCAG), County transportation commissions, and local governments and cooperates actively with all federal and state government agencies. The SCAQMD develops rules and regulations; establishes permitting requirements for stationary sources; inspects emissions sources; and enforces such measures through educational programs or fines, when necessary.

The SCAQMD is directly responsible for reducing emissions from stationary (area and point), mobile, and indirect sources. It has responded to this requirement by preparing a sequence of Air Quality Management Plans (AQMP).

On March 3, 2017, the SCAQMD adopted the 2016 AQMP, which is a regional and multi-agency effort (SCAQMD, CARB, SCAG, and USEPA). The 2016 AQMP represents a comprehensive analysis of emissions, meteorology, atmospheric chemistry, regional growth projections, and the impact of existing control measures. The plan seeks to achieve multiple goals in partnership with other entities promoting reductions in criteria pollutant, greenhouse gases, and toxic risk, as well as efficiencies in energy use, transportation, and goods movement (SCAQMD 2017).

The AQMP, in combination with those from all other California nonattainment areas with serious (or worse) air quality problems, is submitted to CARB for inclusion in the SIP. The SIP relies on the same information from SCAG to develop emission inventories and emission reduction strategies that are included in the attainment demonstration for the air basin. The current federal and state attainment status for the SCAB is presented in Table 3, *South Coast Air Basin Attainment Status*.

The SCAQMD Rule 403, *Fugitive Dust,* requires the implementation of best available dust control measures (BACM) during active operations capable of generating fugitive dust. Rule 403 prohibits the emissions of fugitive dust from any active operation, open storage pile, or disturbed surface area such that the dust remains visible in the atmosphere beyond the property line of the emission source; or the dust emission exceeds 20 percent opacity, if the dust emission is the result of movement of a motorized vehicle (SCAQMD 2005).

Table 3
SOUTH COAST AIR BASIN ATTAINMENT STATUS

Criteria Pollutant	Federal Designation	State Designation
O_3 (1-hour)	(No federal standard)	Nonattainment
O_3 (8-hour)	Extreme Nonattainment	Nonattainment
CO	Attainment (Maintenance)	Attainment
PM_{10}	Attainment (Maintenance)	Nonattainment
$PM_{2.5}$	Serious Nonattainment	Nonattainment
NO_2	Attainment (Maintenance)	Attainment
SO_2	Attainment	Attainment
Lead	Attainment	Attainment
Sulfates	(No federal standard)	Attainment
Hydrogen Sulfide	(No federal standard)	Attainment
Visibility	(No federal standard)	Attainment

Source: SCAQMD 2016
O_3 = ozone; CO = carbon monoxide; PM_{10} = particulate matter 10 micros or less in diameter; $PM_{2.5}$ = particulate matter 2.5 micros or less in diameter; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide

2.2 GREENHOUSE GASES

2.2.1 Climate Change Overview

Global climate change refers to changes in average climatic conditions on Earth including temperature, wind patterns, precipitation, and storms. Global temperatures are moderated by atmospheric gases. These gases are commonly referred to as GHGs because they function like a greenhouse by letting sunlight in but preventing heat from escaping, thus warming the Earth’s atmosphere.

GHGs are emitted by natural processes and human (anthropogenic) activities. Anthropogenic GHG emissions are primarily associated with: (1) the burning of fossil fuels during motorized transport, electricity generation, natural gas consumption, industrial activity, manufacturing, and other activities; (2) deforestation; (3) agricultural activity; and (4) solid waste decomposition.

The temperature record shows a decades-long trend of warming, with 2016 global surface temperatures ranking as the warmest year on record since 1880 and 2017 as the second warmest. The 2017 global average surface temperatures were 0.9 degrees Celsius warmer than the 1951 to 1980 mean temperature (National Aeronautics and Space Administration [NASA] 2018). GHG emissions from human activities are the most significant driver of observed climate change since the mid-20th century (Intergovernmental Panel on Climate Change [IPCC] 2013). The IPCC constructed several emission trajectories of GHGs needed to stabilize global temperatures and climate change impacts. The statistical models show a “high confidence” that temperature increase caused by anthropogenic GHG emissions could be kept to less than two degrees Celsius relative to pre-industrial levels if atmospheric concentrations are stabilized at about 450 parts per million (ppm) carbon dioxide equivalent (CO_2e) by the year 2100 (IPCC 2014).

2.2.2 Types of Greenhouse Gases

The GHGs defined under California’s Assembly Bill (AB) 32 include CO_2, methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Carbon dioxide. CO_2 is the most important and common anthropogenic GHG. CO_2 is an odorless, colorless GHG. Natural sources include the decomposition of dead organic matter; respiration of bacteria, plants, animals, and fungi; evaporation from oceans; and volcanic outgassing. Anthropogenic sources of CO_2 include burning fuels, such as coal, oil, natural gas, and wood. Data from ice cores indicate that CO_2 concentrations remained steady prior to the current period for approximately 10,000 years. The atmospheric CO_2 concentration in 2010 was 390 ppm, 39 percent above the concentration at the start of the Industrial Revolution (about 280 ppm in 1750). As of November 2019, the CO_2 concentration exceeded 410 ppm, a 47 percent increase since 1750 (National Oceanic and Atmospheric Administration [NOAA] 2019).

Methane. CH_4 is the main component of natural gas used in homes. Geological deposits known as natural gas fields contain methane, which is extracted for fuel. Other sources are from decay of organic material in landfills, fermentation of manure, and cattle digestion.

Nitrous oxide. N_2O is produced by both natural and human-related sources. N_2O is emitted during agricultural and industrial activities, as well as during the combustion of fossil fuels and solid waste. Primary human-related sources of N_2O are agricultural soil management, animal manure management, sewage treatment, mobile and stationary combustion of fossil fuel, adipic (fatty) acid production, and nitric acid production.

Hydrofluorocarbons. Fluorocarbons are gases formed synthetically by replacing all hydrogen atoms in methane or ethane with chlorine and/or fluorine atoms. Chlorofluorocarbons are nontoxic, nonflammable, insoluble, and chemically nonreactive in the troposphere (the level of air at Earth's surface). Chlorofluorocarbons were first synthesized in 1928 for use as refrigerants, aerosol propellants, and cleaning solvents. They destroy stratospheric ozone; therefore, their production was stopped as required by the 1989 Montreal Protocol.

Sulfur Hexafluoride. SF_6 is an inorganic, odorless, colorless, nontoxic, nonflammable gas. SF_6 is used for insulation in electric power transmission and distribution equipment, in the magnesium industry, in semi-conductor manufacturing, and as a tracer gas for leak detection.

GHGs have long atmospheric lifetimes that range from one year to several thousand years. Long atmospheric lifetimes allow for GHG emissions to disperse around the globe. Because GHG emissions vary widely in the power of their climatic effects, climate scientists have established a unit called global warming potential (GWP). The GWP of a gas is a measure of both potency and lifespan in the atmosphere as compared to CO_2. For example, because methane and N_2O are approximately 25 and 298 times more powerful than CO_2, respectively, in their ability to trap heat in the atmosphere, they have GWPs of 25 and 298, respectively (CO_2 has a GWP of 1). Estimates of GHG emissions are often presented in CO_2e, which weigh each gas by its GWP. Expressing GHG emissions in CO_2e takes the contribution of all GHG emissions to the greenhouse effect and converts them to a single unit equivalent to the effect that would occur if only CO_2 were being emitted. Emissions of CO_2e are commonly presented in metric tons (MT; 1 MT equals approximately 2,205 pounds). The atmospheric lifetime and GWP of selected GHGs are summarized in Table 4, *Global Warming Potentials and Atmospheric Lifetimes*.

Table 4
GLOBAL WARMING POTENTIALS AND ATMOSPHERIC LIFETIMES

Greenhouse Gas	Atmospheric Lifetime (years)	Global Warming Potential (100-year time horizon)
Carbon Dioxide (CO_2)	50-200	1
Methane (CH_4)	12	25
Nitrous Oxide (N_2O)	114	298
HFC-134a	14	1,430
PFC: Tetraflouromethane (CF_4)	50,000	7,390
PFC: Hexafluoroethane (C_2F_6)	10,000	12,200
Sulfur Hexafluoride (SF_6)	3,200	22,800

Source: IPCC 2007
HFC: hydrofluorocarbon; PFC: perfluorocarbon

2.2.3 Federal Greenhouse Gas Regulations

2.2.3.1 Federal Clean Air Act

The U.S. Supreme Court ruled on April 2, 2007, in *Massachusetts v. U.S. Environmental Protection Agency* (USEPA*)* that CO_2 is an air pollutant, as defined under the CAA, and that the USEPA has the authority to regulate emissions of GHGs. The USEPA announced that GHGs (including CO_2, CH_4, N_2O, HFC, PFC, and SF_6) threaten the public health and welfare of the American people.

2.2.3.2 Light-Duty Vehicle Greenhouse Gas Emissions Standards and Corporate Average Fuel Economy Standards

The USEPA and the National Highway Traffic Safety Administration (NHTSA) have been working together on developing a national program of regulations to reduce GHG emissions and to improve fuel economy of light-duty vehicles. The USEPA is finalizing the first-ever national GHG emissions standards under the CAA, and the NHTSA is finalizing Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act. On April 1, 2010, the USEPA and NHTSA announced a joint Final Rulemaking that established standards for 2012 through 2016 model year vehicles. This was followed up on October 15, 2012, when the agencies issued a Final Rulemaking with standards for model years 2017 through 2025. On August 2, 2018, the agencies released a notice of proposed rulemaking—the Safer Affordable Fuel-Efficient Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks (SAFE Vehicles Rule). The purpose of the SAFE Vehicles Rule is "to correct the national automobile fuel economy and greenhouse gas emissions standards to give the American people greater access to safer, more affordable vehicles that are cleaner for the environment." The direct effect of the rule is to eliminate the standards that were put in place to gradually raise average fuel economy for passenger cars and light trucks under test conditions from 37 miles per gallon in 2020 to 50 miles per gallon in 2025. By contrast, the new SAFE Vehicles Rule freezes the average fuel economy level standards indefinitely at the 2020 levels. The new SAFE Vehicles Rule also results in the withdraw of the waiver previously provided to California for that State's GHG and zero emissions vehicle (ZEV) programs under section 209 of the CAA. The combined USEPA GHG emission standards and NHTSA CAFE standards resolve previously conflicting requirements under both federal programs and the standards of the State of California and other states that have adopted the California standards (USEPA and NHTSA 2018 and 2012).

2.2.4 California Greenhouse Gas Regulations

2.2.4.1 California Code of Regulations, Title 24, Part 6

California Code of Regulations (CCR) Title 24 Part 6: California's Energy Efficiency Standards for Residential and Nonresidential Buildings were first established in 1978 in response to a legislative mandate to reduce California's energy consumption. Energy-efficient buildings require less electricity, natural gas, and other fuels. Electricity production from fossil fuels and on-site fuel combustion (typically for water heating) results in GHG emissions.

The Title 24 standards are updated approximately every three years to allow consideration and possible incorporation of new energy efficiency technologies and methods. The latest update to the Title 24 standards occurred in 2016 and went into effect on January 1, 2017. The 2019 Standards will continue to improve upon the 2016 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2019 Standards will go into effect on January 1, 2020. The Building Energy Efficiency Standards focus on several key areas to improve the energy efficiency of newly constructed buildings and additions and alterations to existing buildings. The most significant efficiency improvements to the residential standards include improvements for attics, walls, water heating, and lighting. The standards are divided into three basic sets. First, there is a basic set of mandatory requirements that apply to all buildings. Second, there is a set of performance standards – the energy budgets – that vary by climate zone (of which there are 16 in California) and building type; thus, the standards are tailored to local conditions. Finally, the third set constitutes an alternative to the performance standards, which is a set of prescriptive packages that are basically a recipe or a checklist compliance approach.

2.2.4.2 California Green Building Standards Code

The California Green Building Standards Code (CALGreen; CCR Title 24, Part 11) is a code with mandatory requirements for new residential and nonresidential buildings (including industrial buildings) throughout California. The code is Part 11 of the California Building Standards Code in Title 24 of the CCR (California Building Standards Commission 2017). The current 2016 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings went into effect on January 1, 2017. The 2019 Standards will continue to improve upon the 2016 Standards for new construction of, and additions and alterations to, residential and nonresidential buildings. The 2019 Standards will go into effect on January 1, 2020.

The development of CALGreen is intended to (1) cause a reduction in GHG emissions from buildings; (2) promote environmentally responsible, cost-effective, healthier places to live and work; (3) reduce energy and water consumption; and (4) respond to the directives by the Governor. In short, the code is established to reduce construction waste; make buildings more efficient in the use of materials and energy; and reduce environmental impact during and after construction.

CALGreen contains requirements for storm water control during construction; construction waste reduction; indoor water use reduction; material selection; natural resource conservation; site irrigation conservation; and more. The code provides for design options allowing the designer to determine how best to achieve compliance for a given site or building condition. The code also requires building commissioning, which is a process for the verification that all building systems, like heating and cooling equipment and lighting systems, are functioning at their maximum efficiency.

2.2.4.3 Executive Order S-3-05

On June 1, 2005, Executive Order (EO) S-3-05 proclaimed that California is vulnerable to climate change impacts. It declared that increased temperatures could reduce snowpack in the Sierra Nevada, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To avoid or reduce climate change impacts, EO S-3-05 calls for a reduction in GHG emissions to the year 2000 level by 2010, to year 1990 levels by 2020, and to 80 percent below 1990 levels by 2050. EOs are not laws and can only provide the governor's direction to state agencies to act within their authority. Legislation is required to enact the goals of EO S-3-05 and establish a framework for statewide implementation. AB 32, described below, mandates the 2020 GHG reduction goals of EO S-3-05. The 2050 GHG reduction goal of EO S-3-05 has not been enacted by any legislation and remains only a goal of the EO.

2.2.4.4 Executive Order B-30-15

On April 29, 2015, EO B-30-15 established a California GHG emission reduction target of 40 percent below 1990 levels by 2030. The EO aligns California's GHG emission reduction targets with those of leading international governments, including the 28-nation European Union. California is on track to meet or exceed the target of reducing greenhouse gas emissions to 1990 levels by 2020, as established in AB 32. California's new emission reduction target of 40 percent below 1990 levels by 2030 will make it possible to reach the goal established by EO S-3-05 of reducing emissions 80 percent under 1990 levels by 2050. Senate Bill (SB) 32, described below, mandates the 2030 GHG reduction goals of EO B-30-15.

2.2.4.5 Assembly Bill 32 – Global Warming Solution Act of 2006

The California Global Warming Solutions Act of 2006 (Assembly Bill 32 and Health and Safety Code Sections 38500, 38501, 28510, 38530, 38550, 38560, 38561–38565, 38570, 38571, 38574, 38580, 38590, 38592–38599), widely known as AB 32, requires that the CARB develop and enforce regulations for the reporting and verification of statewide GHG emissions. CARB is directed to set a GHG emission limit, based on 1990 levels, to be achieved by 2020. The bill requires CARB to adopt rules and regulations in an open public process to achieve the maximum technologically feasible and cost-effective GHG reductions. AB 32 enacts the goals of EO S-3-05.

2.2.4.6 Senate Bill 32

SB 32 (Amendments to the California Global Warming Solutions Action of 2006) extends 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, which set the next interim step in the State's continuing efforts to pursue the long-term target expressed in EO B-30-15 of 80 percent below 1990 emissions levels by 2050.

2.2.4.7 Assembly Bill 197

A condition of approval for SB 32 was the passage of AB 197. AB 197 requires that CARB consider the social costs of GHG emissions and prioritize direct reductions in GHG emissions at mobile sources and large stationary sources. AB 197 also gives the California legislature more oversight over CARB through the addition of two legislatively appointed members to the CARB Board and the establishment a legislative committee to make recommendations about CARB programs to the legislature.

2.2.4.8 Assembly Bill 1493 – Vehicular Emissions of Greenhouse Gases

AB 1493 (Pavley) requires that CARB develop and adopt regulations that achieve "the maximum feasible reduction of GHGs emitted by passenger vehicles and light-duty truck and other vehicles determined by CARB to be vehicles whose primary use is noncommercial personal transportation in the State." On September 24, 2009, CARB adopted amendments to the Pavley regulations that intend to reduce GHG emissions in new passenger vehicles from 2009 through 2016. The amendments bind California's enforcement of AB 1493 (starting in 2009), while providing vehicle manufacturers with new compliance flexibility. The amendments also prepare California to merge its rules with the federal CAFE rules for passenger vehicles (CARB 2013). In January 2012, CARB approved a new emissions-control program for model years 2017 through 2025. The program combines the control of smog, soot, and global warming gases and requirements for greater numbers of zero-emission vehicles into a single packet of standards called Advanced Clean Cars (CARB 2013).

2.2.4.9 Assembly Bill 75

AB 75 was passed in 1999 and mandates state agencies to develop and implement an integrated waste management plan to reduce GHG emissions related to solid waste disposal. In addition, the bill mandates that community service districts providing solid waste services report the disposal and diversion information to the appropriate city, county, or regional jurisdiction. The bill requires diversion of at least 50 percent of the solid waste from landfills and transformation facilities, and submission to the California Department of Resources Recycling and Recovery (CalRecycle; formerly known as California Integrated Waste Management Board) of an annual report describing the diversion rates.

2.2.4.10 Assembly Bill 341

The state legislature enacted AB 341 (California Public Resource Code Section 42649.2), increasing the diversion target to 75 percent statewide. AB 341 requires all businesses and public entities that generate 4 cubic yards or more of waste per week to have a recycling program in place. The final regulation was approved by the Office of Administrative Law on May 7, 2012 and went into effect on July 1, 2012.

2.2.4.11 Executive Order S-01-07

EO S-01-07, signed by Governor Schwarzenegger on January 18, 2007, directs that a statewide goal be established to reduce the carbon intensity of California's transportation fuels by at least 10 percent by the year 2020. It orders that a Low Carbon Fuel Standard (LCFS) for transportation fuels be established for California and directs CARB to determine whether a LCFS can be adopted as a discrete early action measure pursuant to AB 32. CARB approved the LCFS as a discrete early action item with a regulation adopted and implemented in April 2010. Although challenged in 2011, the Ninth Circuit reversed the District Court's opinion and rejected arguments that implementing LCFS violates the interstate commerce clause in September 2013. CARB is therefore continuing to implement the LCFS statewide.

2.2.4.12 Senate Bill 350

Approved by Governor Brown on October 7, 2015, SB 350 increases California's renewable electricity procurement goal from 33 percent by 2020 to 50 percent by 2030. This will increase the use of Renewables Portfolio Standard eligible resources, including solar, wind, biomass, and geothermal. In addition, large utilities are required to develop and submit Integrated Resource Plans to detail how each entity will meet their customers resource needs, reduce greenhouse gas emissions, and increase the use of clean energy.

2.2.4.13 Senate Bill 100

Approved by Governor Brown on September 10, 2018, SB 100 increases the portion of California's electricity that must come from renewable sources from 50 percent (as mandated by SB 350) to 60 percent by 2030. The bill also establishes a goal of 100 percent of California's electricity sourced from renewable energy and other zero net GHG emissions resources (such as nuclear power) by 2045.

2.2.5 Senate Bill 97 – CEQA: Greenhouse Gas Emissions

SB 97 required the Governor's Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA, including but not limited to, effects associated with transportation or energy consumption. The Resources Agency certified and adopted the guidelines on December 31, 2009. The OPR guidance states that the lead agency can rely on qualitative or other performance-based standards for estimating the significance of GHG emissions, although the new CEQA Guidelines did not establish a threshold of significance.

2.2.6 Senate Bill 375

SB 375 aligns regional transportation planning efforts, regional GHG reduction targets, and affordable housing allocations. Metropolitan Planning Organizations (MPOs) are required to adopt a Sustainable Communities Strategy (SCS), which allocates land uses in the MPOs' Regional Transportation Plan (RTP). Qualified projects consistent with an approved SCS or Alternative Planning Strategy categorized as "transit priority projects" would receive incentives to streamline CEQA processing.

2.2.6.1 California Air Resources Board: Climate Change Scoping Plan

In December 2008, CARB adopted its first version of its Climate Change Scoping Plan (Scoping Plan), which contained the main strategies California will implement to achieve the mandate of AB 32 to reduce statewide GHG emissions to 1990 levels by 2020. The Scoping Plan establishes an overall framework for the measures that will be adopted to reduce California's GHG emissions. The Scoping Plan evaluates opportunities for sector-specific reductions, integrates all CARB and Climate Action Team early actions and additional GHG reduction measures by both entities, identifies additional measures to be pursued as regulations, and outlines the role of a cap-and-trade program.

On December 14, 2017, CARB adopted the 2017 Climate Change Scoping Plan (2017 Scoping Plan), which lays out the framework for achieving the mandate of SB 32 (2016) to reduce statewide GHG emissions to at least 40 percent below 1990 levels by the end of 2030 (CARB 2017).

The 2017 Scoping Plan includes guidance to local governments in Chapter 5, including plan-level GHG emissions reduction goals and methods to reduce communitywide GHG emissions. In its guidance, CARB recommends that "local governments evaluate and adopt robust and quantitative locally-appropriate goals that align with the statewide per capita targets and the State's sustainable development objectives and develop plans to achieve the local goals." CARB further states that "it is appropriate for local jurisdictions to derive evidence-based local per capita goals [or some other metric] that the local jurisdiction deems appropriate, such as mass emissions or per service population, based on local emissions sectors and population projections that are consistent with the framework used to develop the statewide per capita targets" (CARB 2017).

2.2.7 Local Regulations

2.2.7.1 Southern California Association of Governments

SCAG, of which the City of Perris (City) is a member agency, adopted the 2016-2040 RTP/SCS in April 2016. The RTP/SCS is a State- and federally required long-range plan for regional transportation and land use. The plan anticipates expenditures of $556.5 billion—of which $275.5 billion is budgeted for operations and maintenance of the regional transportation system and another $246.6 billion is reserved for transportation capital improvements. It is anticipated that implementation of the RTP/SCS would result in an eight percent reduction in GHG emissions per capita by 2020, an 18 percent reduction by 2035 and a 21 percent reduction by 2040, compared with 2005 levels (SCAG 2016).

2.2.7.2 Western Riverside Council of Governments

The twelve cities of the Western Riverside Council of Governments (WRCOG), which includes the City, adopted a Subregional Climate Action Plan (CAP) in September 2014. The CAP provides a 2010 baseline inventory of GHG emissions for the subregion cities of 5,834,400 MT of CO_2e. Approximately 57 percent of the GHG inventory was from transportation sources, 21 percent from commercial/industrial energy use, 20 percent from residential energy use, and the remaining from waste water and solid waste sources. The CAP established a target of reducing subregional GHG emissions 15 percent below 2010 levels by 2020 and 49 percent below 2010 levels by 2035. To achieve the 2020 reduction target, the CAP identifies 14 State and regional measures, 3 local energy sector measures, 18 local transportation sector measures, and 2 solid waste sector measures. The CAP does not identify GHG reduction measures for achieving goals beyond 2020 (WRCOG 2014). The CAP does not include thresholds for determining the significance of GHG emissions for new land development, nor does it include a checklist or other methodology for determining consistency of new development with the goals and measures in the CAP. Since adoption of the original Subregional CAP, WRCOG received grant funding from the California Department of Transportation (Caltrans) Sustainable Transportation Planning Grant Program to prepare an update and expansion to the Subregional CAP, which is termed the CAP Update. The CAP Update will include a comprehensive update to GHG inventories and GHG emissions reduction strategies for all sectors and will establish GHG targets for the year 2050 for WRCOG member jurisdictions.

2.2.7.3 City of Perris

In February 2016, the City adopted a CAP, based on WRCOG's Subregional CAP, that addresses global climate change through the reduction of GHG emissions at the community level to be compliant with AB 32. The City's CAP utilizes WRCOG's analysis of existing GHG reduction programs and policies that have already been implemented in the subregion and of applicable best management practices from other regions to assist in meeting the subregional reduction target goals. Through its CAP, the City, as with other jurisdictional members of WRCOG, has adopted measures from the Subregional CAP and independently determined the level of implementation of each measure. As with the WRCOG Subregional CAP, the City's CAP does not include numerical thresholds for determining the significance of GHG emissions for new land development, nor does it include a checklist or other methodology for determining consistency of new development with the goals and measures in the CAP.

3.0 EXISTING CONDITIONS

3.1 CLIMATE AND METEOROLOGY

The Project site is in the SCAB, which consists of all or part of four counties: Los Angeles, San Bernardino, Riverside, and Orange. The distinctive climate of the SCAB is determined by its terrain and geographic location. The SCAB is a coastal plain with connecting broad valleys and low hills. It is bound by the Pacific Ocean to the southwest and high mountains around the rest of its perimeter. The general region lies in the semi-permanent high-pressure zone of the eastern Pacific, resulting in a mild climate tempered by cool sea breezes with light, average wind speeds.

The usually mild climatological pattern is interrupted occasionally by periods of extremely hot weather, winter storms, or Santa Ana winds. Winds in the Project area are usually driven by the dominant land/ sea breeze circulation system. Regional wind patterns are dominated by daytime onshore sea breezes. At night, the wind generally slows and reverses direction traveling toward the sea. Local canyons can also alter wind direction, with wind tending to flow parallel to the canyons. The vertical dispersion of air pollutants in the SCAB is hampered by the presence of persistent temperature inversions. High pressure systems, such as the semi-permanent high-pressure zone in which the SCAB is located, are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface, and resulting in the formation of subsidence inversions. Such inversions restrict the vertical dispersion of air pollutants released into the marine layer and, together with strong sunlight, can produce worst-case conditions for the formation of photochemical smog.

The annual average maximum temperature as measured at the Elsinore climatic station, approximately 9 miles northwest of the Project site, is 80.6° Fahrenheit (F). The highest monthly average maximum temperature (98.1°F) occurs in July and August, and the lowest monthly average minimum temperature (36.4°F) occurs in January (Western Regional Climate Center [WRCC] 2017). The average annual precipitation is approximately 12 inches (WRCC 2017).

3.2 EXISTING AIR QUALITY

3.2.1 Criteria Pollutants

3.2.1.1 Attainment Designations

Attainment designations are discussed in Section 2.1 and Table 3. The SCAB is a federal and state nonattainment area for ozone and $PM_{2.5}$. The SCAB is also a state nonattainment area for PM_{10}.

3.2.1.2 Monitored Air Quality

The SCAQMD maintains monitoring stations to measure ambient concentrations of pollutants in the SCAB. The nearest monitoring station to the Project site is the Perris monitoring station, located approximately 1.6 miles east of the Project site. The Perris station monitors ozone and PM_{10}. Data from the Lake Elsinore – W. Flint Street monitoring station, located approximately 9 miles southwest of the Project site, was used for $PM_{2.5}$ and NO_2. Table 5, *Air Quality Monitoring Data*, presents a summary of the ambient pollutant concentrations monitored at the Perris and Lake Elsinore air quality monitoring stations during the years of 2016 through 2018 for which the SCAQMD has reported data. As shown in

Table 5, the 1- and 8-hour ozone standards, as well as the state PM_{10} standard, were exceeded numerous times in each of the sample years.

Table 5
AIR QUALITY MONITORING DATA

Pollutant Standards	2016	2017	2018
Ozone (O_3)			
Maximum concentration 1-hour period (ppm)	0.131	0.120	0.117
Maximum concentration 8-hour period (ppm)	0.098	0.105	0.103
Days above 1-hour state standard (>0.09 ppm)	23	33	31
Days above 8-hour state/federal standard (>0.070 ppm)	55	90	67
Nitrogen Dioxide (NO_2)			
Maximum 1-hour concentration (ppm)	0.051	0.049	0.041
Days above state 1-hour standard (0.18 ppm)	0	0	0
Days above federal 1-hour standard (0.100 ppm)	0	0	0
Coarse Particulates (PM_{10})			
Maximum 24-hour concentration (µg/m^3)	76.0	75.4	64.4
Days above state standard (>50 µg/m^3)	5	11	2
Days above federal standard (>150 µg/m^3)	0	0	0
Fine Particulates ($PM_{2.5}$)			
Maximum 24-hour concentration (µg/m^3)	31.5	27.2	31.2
Days above federal standard (>35 µg/m^3)	*	*	*

Source: CARB 2019a
ppm = parts per million
*Insufficient data available to determine the value

3.2.2 Greenhouse Gases

For 2012, total GHG emissions worldwide were estimated at 46,049 MMT CO_2e (World Resources Institute 2017). The U.S. contributed the second largest portion of GHG emissions (behind China) at 12 percent of global emissions, with 5,823 MMT CO_2e in 2012. On a national level in 2013, approximately 27 percent of GHG emissions are associated with transportation and about 31 percent are associated with electricity generation (USEPA 2015).

CARB performs statewide GHG inventories. The inventory is divided into six broad sectors; agriculture and forestry, commercial, electricity generation, industrial, residential, and transportation. Emissions are quantified in MMT CO_2e. Table 6, *California Greenhouse Gas Emissions by Sector*, shows the estimated statewide GHG emissions for the years 1990, 2000, 2010, and 2017.

Table 6
CALIFORNIA GREENHOUSE GAS EMISSIONS BY SECTOR
(MMT CO_2e)

Sector	1990	2000	2010	2017
Agriculture and Forestry	18.9 (4%)	31.0 (7%)	33.7 (8%)	32.4 (8%)
Commercial	14.4 (3%)	14.1 (3%)	20.1 (4%)	23.3 (5%)
Electricity Generation	110.5 (26%)	105.4 (22%)	90.6 (20%)	62.6 (15%)
Industrial	105.3 (24%)	105.8 (22%)	101.8 (23%)	101.1 (24%)
Residential	29.7 (7%)	31.7 (7%)	32.1 (7%)	30.4 (7%)
Transportation	150.6 (35%)	183.2 (39%)	170.2 (38%)	174.3 (41%)
Unspecified Remaining	1.3 (<1%)	-	-	-
TOTAL	**430.7**	**471.1**	**448.5**	**424.1**

Source: CARB 2007 and CARB 2018c
MMT = million metric tons; CO_2e = carbon dioxide equivalent

As shown in Table 7, statewide GHG emissions totaled 431 MMT CO_2e in 1990, 471 MMT CO_2e in 2000, 448 MMT CO_2e in 2010, and 424 MMT CO_2e in 2017. Transportation-related emissions consistently contribute the most GHG emissions, followed by electricity generation and industrial emissions.

The WRCOG prepared an emissions inventory as part of their Subregional CAP. In 2010, Subregional CAP cities emitted approximately 5,834,400 metric tons of GHG emissions. The breakdown of emissions by sector is shown below in Table 7, *Western Riverside Council of Governments Greenhouse Gas Emissions by Sector*. With the exception of transportation, the sectors reported in the CAP inventory do not correspond directly to those reported in the statewide inventory.

Table 7
WESTERN RIVERSIDE COUNCIL OF GOVERNMENTS
GREENHOUSE GAS EMISSIONS BY SECTOR

Sector	2010
Transportation	57%
Commercial/Industrial Energy	21%
Residential Energy	22%
Solid Waste	2%
Wastewater	<1%
TOTAL	**5.834 MMT CO_2e**

Source: WRCOG 2014
MMT = million metric tons; CO_2e = carbon dioxide equivalent

Similar to the statewide emissions, transportation-related GHG emissions for the Subregional CAP cities were the greatest contributor, followed by energy-related GHG emissions.

The City also prepared a community-level emissions inventory as part of their CAP. In 2010, the City emitted 379,099 metric tons of GHG emissions. The breakdown of the City's emissions by sector is shown below in Table 8, *City of Perris Greenhouse Gas Emissions by Sector.*

Table 8
CITY OF PERRIS GREENHOUSE GAS EMISSIONS BY SECTOR

Sector	2010
Transportation	60%
Commercial/Industrial Energy	15%
Residential Energy	20%
Solid Waste	2%
Wastewater	3%
TOTAL	**0.379 MMT CO_2e**

Source: City 2016
MMT = million metric tons; CO_2e = carbon dioxide equivalent

As with both the statewide and WRCOG emissions, transportation-related GHG emissions for the City were the greatest contributor, followed by energy-related GHG emissions.

4.0 METHODOLOGY AND SIGNIFICANCE CRITERIA

4.1 METHODOLOGY

With the exception of localized concentrations of pollutants and TACs, air pollution is largely a cumulative impact. The nonattainment status of regional criteria pollutants is a result of past and present development within the SCAB. Thus, this regional impact is a cumulative impact, and the Project's impact on the SCAB attainment status resulting from short-term construction and long-term operation emissions is evaluated cumulatively.

Criteria pollutant and GHG emissions for Project construction and operation were calculated using the California Emissions Estimator Model (CalEEMod), Version 2016.3.2. CalEEMod is a statewide land use emissions computer model designed to provide a uniform platform for government agencies, land use planners, and environmental professionals to quantify potential criteria pollutant and GHG emissions associated with both construction and operations from a variety of land use projects. The model was developed for CAPCOA in collaboration with the California air districts. CalEEMod allows for the use of default data (e.g., emission factors, trip lengths, meteorology, source inventory) provided by the various California air districts to account for local requirements and conditions, and/or user-defined inputs. The calculation methodology and input data used in CalEEMod can be found in the CalEEMod User's Guide Appendices A, D, and E (CAPCOA 2017). The input data and subsequent construction and operation emission estimates for the proposed Project are discussed below. CalEEMod output files for the Project are included in Appendix A to this report.

4.1.1 Construction Emissions

As described above, construction emissions were estimated using CalEEMod version 2016.3.2. The model uses OFFROAD2011 emission factors and EMFAC2014 emission factors from CARB's models for off-road equipment and on-road vehicles, respectively. The construction analysis included modeling of the projected construction equipment that would be used during each construction activity and quantities of earth and debris to be moved. The model calculates emissions of CO, PM_{10}, $PM_{2.5}$, SO_2, the ozone precursors ROG and NO_X, and the GHGs CO_2, N_2O, and CH_4 reported as CO_2e.

Construction input data for CalEEMod include, but are not limited to, (1) the anticipated start and finish dates of construction activity; (2) inventories of construction equipment to be used; (3) areas to be excavated and graded; and (4) volumes of materials to be exported from and imported to the project area. The analysis assessed maximum daily emissions from individual construction activities, including site preparation, grading, structure construction, paving, and architectural coating. Construction equipment estimates are based CalEEMod defaults. Table 9, *Construction Equipment Assumptions*, presents a summary of the assumed equipment that would be involved in each phase of construction.

Table 9
CONSTRUCTION EQUIPMENT ASSUMPTIONS

Construction Phase	Equipment	Number	Daily Hours per Equipment
Site Preparation	Rubber Tired Dozer	3	8
	Tractor/Loader/Backhoe	4	8
Grading	Excavator	2	8
	Graders	1	8
	Rubber Tired Dozers	1	8
	Scrapers	2	8
	Tractor/Loader/Backhoe	2	8
Building Construction	Cranes	1	7
	Forklifts	3	8
	Generator Sets	1	8
	Tractor/Loader/Backhoe	3	7
	Welders	1	8
Paving	Pavers	2	8
	Paving Equipment	2	8
	Rollers	2	8
Architectural Coating	Air Compressor	1	6

Source: CalEEMod
Note: Complete equipment data, including equipment horsepower and load factor, is included in Appendix A.

The construction schedule was based on CalEEMod defaults with the building construction phase reduced based on the limited structures to be provided at the proposed park. As shown in Table 10, *Anticipated Construction Schedule*, Project development is assumed to start in September 2020 and projected to be complete November 2021.

Table 10
ANTICIPATED CONSTRUCTION SCHEDULE

Construction Activity	Construction Period		
	Start	End	Number of Working Days
Site Preparation	9/1/2020	9/14/2020	10
Grading	9/15/2020	11/2/2020	35
Building Construction	11/3/2020	9/30/2021	238
Paving	10/1/2021	10/28/2021	20
Architectural Coating	10/29/2021	11/25/2021	20

Source: CalEEMod.

The quantity, duration, and the intensity of construction activity influence the amount of construction emissions and their related pollutant concentrations that occur at any one time. As such, the emission forecasts provided herein reflect a specific set of conservative assumptions based on the expected construction scenario wherein a relatively large amount of construction is occurring in a relatively intensive manner. Because of this conservative assumption, actual emissions could be less than those forecast. If construction is delayed or occurs over a longer time period, emissions could be reduced because of (1) a more modern and cleaner-burning construction equipment fleet mix than incorporated in the CalEEMod, and/or (2) a less intensive buildout schedule (i.e., fewer daily emissions occurring over a longer time interval). A complete listing of the assumptions used in the analysis and model output is provided in Appendix A of this report.

CalEEMod has the capability to calculate reductions in construction emissions from the effects of dust control, diesel-engine classifications, and other selected emissions reduction measures. Emissions calculations assume application of water on all unpaved roads and disturbed surfaces a minimum of twice per day during site preparation and grading in compliance with SCAQMD Rule 403, Fugitive Dust.

4.1.2 Operation Emissions

Emissions related to long-term operation were estimated using CalEEMod. Operational sources of emissions include area, energy, transportation, water use, and solid waste. Operational emissions from area sources include the use of consumer products and engine emissions from landscape maintenance equipment. Model output data sheets are included in Appendix A.

Operational emissions from mobile sources are associated with Project-related vehicle trip generation and trip length. The Focused Traffic Assessment that was prepared for the Project estimated that the Project would generate 90 daily trips on weekdays and 450 daily trips on weekends (Urban Crossroads 2019). CalEEMod defaults for trip purposes and distances were used.

CalEEMod defaults for area, energy, water use, and solid waste sources were used.

4.1.3 Localized Significance Threshold Methodology

As part of the SCAQMD's environmental justice program, more attention has been focused on localized air quality effects. In addition to the California Environmental Quality Act (CEQA) significance thresholds for mass daily emissions and regional conditions, the SCAQMD has established thresholds for ambient air quality (Table 11, *SCAQMD Thresholds of Significance*) to address localized impacts. Also, while regional impact analysis is based on attaining or maintaining regional emissions standards, localized impact analysis compares the concentration of a pollutant at a receptor site to a health-based standard.

SCAQMD staff then developed localized significance threshold (LST) methodology and mass rate look-up tables by source receptor area (SRA) that can be used by public agencies to determine whether a project may generate significant adverse localized air quality impacts. LSTs represent the maximum emissions from a project that will not cause or contribute to an exceedance of the most stringent applicable federal or state ambient air quality standard; they are developed based on the ambient concentrations of that pollutant for each SRA (SCAQMD 2009). The LST methodology translates the concentration standards into emissions thresholds that are a function of project site area, source to receptor distance, and the location within the SCAB. The LST methodology is recommended to be limited to projects of 5 acres or less and to avoid the need for complex dispersion modeling. For projects that exceed 5 acres, the 5-acre LST look-up values can be used as a screening tool to determine which pollutants require detailed analysis. This approach is conservative as it assumes that all on-site emissions would occur within a five-acre area resulting in inflated potential localized impacts (i.e., more pollutant emissions occurring within a smaller area and within closer proximity to potential sensitive receptors). If a project exceeds the LST look-up values, then the SCAQMD recommends that project-specific localized air quality modeling be performed.

For construction emissions, the LST look-up values are determined using the maximum area disturbed per day rather than the size of the project site. The maximum area disturbed per day was determined for the construction phase resulting in the maximum pollutant emissions in accordance with the methodology in the SCAQMD's *Fact Sheet for Applying CalEEMod to LSTs* (n.d.). While the maximum emissions of PM_{10} and $PM_{2.5}$ occur during the site preparation phase, the maximum emissions of ROG, NO_X, and CO occur during the grading phase, and the grading phase utilizes more pieces of equipment than the site preparation phase. The maximum area disturbed during the grading phase was calculated using the total daily use of 8 hours for one grader, one rubber tired dozer, and two scrapers, as listed in Table 9. The maximum area disturbed per day during the grading phase would be 3 acres. Therefore, the LST values for allowable emissions for a 5-acre site during construction were used.

The City of Perris is located within SRA 24, Perris Valley. The closest off-site sensitive receptors to the Project are the numerous single-family residences that are located immediately adjacent to the Project site's western and eastern boundaries. The closest receptor distance on the mass rate LST look-up tables is 25 meters (82 feet). According to the SCAQMD's *Final Localized Significance Threshold Methodology,* projects with boundaries located closer than 25 meters to the nearest receptor should use the LSTs for receptors located at 25 meters (SCAQMD 2008).

4.2 SIGNIFICANCE CRITERIA

4.2.1 Air Quality

The following significance thresholds are based on Appendix G of the state CEQA Guidelines. A significant impact is identified if the Project would result in any of the following:

(1) Conflict with or obstruct implementation of the applicable air quality plan;

(2) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard;

(3) Expose sensitive receptors to substantial pollutant concentrations; or

(4) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Appendix G of the State CEQA Guidelines states that the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the above determinations. The SCAQMD has established significance thresholds to assess the regional and localized impacts of project-related air pollutant emissions. The significance thresholds are updated, as needed, to appropriately represent the most current technical information and attainment status in the SCAB. Table 11, *SCAQMD Air Quality Significance Thresholds*, presents the most current significance thresholds, including regional daily thresholds for short-term construction and long-term operational emissions; maximum incremental cancer risk and hazard indices for TACs; and maximum ambient concentrations for exposure of sensitive receptors to localized pollutants. If the Project's criteria pollutant and precursor emissions are below the SCAQMD daily regional thresholds, the Project would not result in a cumulatively considerable net increase of any criteria pollutant. If the Project's emissions of criteria pollutants, precursors, and TACs result in localized concentrations and/or risk values below the SCAQMD thresholds, the Project's impacts to sensitive receptors would be less than significant.

Table 11
SCAQMD AIR QUALITY SIGNIFICANCE THRESHOLDS

Mass Daily Thresholds (pounds per day)		
Pollutant	**Construction**	**Operation**
VOC	75	55
NO_X	100	55
CO	550	550
PM_{10}	150	150
$PM_{2.5}$	55	55
SO_X	150	150
Lead	3	3
Toxic Air Contaminants		
TACs	Maximum Incremental Cancer Risk ≥ 10 in 1 million Cancer Burden > 0.5 excess cancer cases (in areas ≥ 1 in 1 million) Chronic & Acute Hazard Index ≥ 1.0 (project increment)	
Ambient Air Quality for Criteria Pollutants		
NO_2	1-hour average ≥ 0.18 ppm Annual average ≥ 0.03 ppm	
CO	1-hour average ≥ 20.0 ppm (state) 8-hour average ≥ 9.0 ppm (state/federal)	
PM_{10}	24-hour average ≥ 10.4 μg/m^3 (construction) 24-hour average ≥ 2.5 μg/m^3 (operation) Annual average ≥ 1.0 μg/m^3	
$PM_{2.5}$	24-hour average ≥ 10.4 μg/m^3 (construction) 24-hour average ≥ 2.5 μg/m^3 (operation)	
SO_2	24-hour average ≥ 25 μg/m^3	

Source: SCAQMD 2015
lbs/day: pounds per day; VOC: volatile organic compound; NO_X: nitrogen oxides; CO: carbon monoxide;
PM_{10}: respirable particulate matter with a diameter of 10 microns or less;
$PM_{2.5}$: fine particulate matter with a diameter of 2.5 microns or less; SO_X: sulfur oxides;
TACs: toxic air contaminants; GHG: greenhouse gas emissions; MT/yr: metric tons per year; NO_2: nitrogen dioxide;
ppm: parts per million; μg/m^3: micrograms per cubic meter

4.2.2 Greenhouse Gases

GHG impacts are the result of combined worldwide emissions over many years, and additional development would incrementally contribute to the significant adverse environmental impacts of global climate change. No single project could generate enough GHG emissions to contribute noticeably to a change in the global average temperature. However, the combination of GHG emissions from past, present, and future projects contribute substantially to the phenomenon of global climate change and its associated environmental impacts. Therefore, GHG emissions impacts are only evaluated cumulatively.

According to Appendix G of the CEQA Guidelines, a project would have a significant environmental impact if it would:

1. Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

2. Conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing the emissions of GHGs.

There are no established federal, state, or local quantitative thresholds applicable to the Project to determine the quantity of GHG emissions that may have a significant effect on the environment. CARB, the SCAQMD, and various cities and agencies have proposed, or adopted on an interim basis, thresholds of significance that require the implementation of GHG emission reduction measures. For the proposed Project, the most appropriate screening threshold for determining GHG emissions is the SCAQMD proposed Tier 3 screening threshold (SCAQMD 2010). The SCAQMD's Tier 3 screening threshold was developed to meet the year 2020 statewide GHG emissions targets as mandated by AB 32 and implemented by the CARB Scoping Plan. The SCAQMD has not proposed revised thresholds to account for GHG reduction targets beyond 2020. Accordingly, a threshold reduced by 4.98 percent for each year between 2020 and 2030 would meet the mandates of SB 32. The first full year of operation for the project is anticipated to be 2022. Therefore, a threshold of 2,709 MT CO_2e per year is used in this analysis.

5.0 AIR QUALITY IMPACT ANALYSIS

This section evaluates potential direct impacts of the proposed Project related to the air pollutant emissions. Project-level air quality modeling was completed as part of this analysis. Complete modeling results are included as Appendix A to this report.

5.1 CONSISTENCY WITH AIR QUALITY PLANS

SCAG is the regional planning agency for Los Angeles, Orange, Ventura, Riverside, San Bernardino, and Imperial Counties, and addresses regional issues relating to transportation, economy, community development, and environment. With regard to air quality planning, SCAG has prepared the Regional Transportation Plan/Sustainable Communities Strategy (RTP/SCS), a long-range transportation plan that uses growth forecasts to project trends over a 20-year period to identify regional transportation strategies to address mobility needs. These growth forecasts form the basis for the land use and transportation control portions of the AQMP. These documents are utilized in the preparation of the air quality forecasts and consistency analysis included in the AQMP. Both the RTP/SCS and AQMP are based, in part, on projections originating with County and City General Plans.[2]

The two principal criteria for determining conformance to the AQMP are:

1. Whether the Project would result in an increase in the frequency or severity of existing air quality violations; cause or contribute to new violations; or delay timely attainment of air quality standards and

2. Whether the Project would exceed the assumptions in the AQMP.

With respect to the first criterion, the analyses presented in Sections 5.2 through 5.4, below, demonstrate that the Project would not generate short-term or long-term emissions that could potentially cause an increase in the frequency or severity of existing air quality violations; cause or contribute to new violations; or delay timely attainment of air quality standards. With respect to the

[2] SCAG serves as the federally designated MPO for the Southern California region.

second criterion, the Project site and surrounding areas have a land use designation of Single Family Residential (R-6,000) in the City of Perris General Plan and are zoned as Mobile Home Subdivision (R-5). The Project proposes a public park, which does not conflict with the Single Family Residential land use designation or the Mobile Home Subdivision zoning. The Land Use Element of the City of Perris General Plan specifically states that the region, categorized as Planning Area 7: Westside Residential, is in need of active parkland and sports fields for use by residents. As such, implementation of the proposed Project would align with the goals in the General Plan. In addition, as a public park in an existing neighborhood, the proposed Project is not anticipated to generate population growth in the community. Based on these considerations, the Project would not exceed the projections of the City's General Plan; the same growth projections are used in the RTP/SCS and AQMP. Therefore, the Project would not obstruct implementation of the AQMP, and the impact would be less than significant.

5.2 CUMULATIVELY CONSIDERABLE NET INCREASE OF NONATTAINMENT CRITERIA POLLUTANTS

The Project would generate criteria pollutants and precursors in the short-term during construction and the long-term during operation. To determine whether the Project's emissions would result a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment, or contribute substantially to a projected air quality violation, the Project's emissions were evaluated based on the quantitative emission thresholds established by the SCAQMD (as shown in Table 11).

5.2.1 Construction Emissions

Construction emissions associated with implementing the Project were estimated using CalEEMod, as described in Section 4.1.1. Project-specific input was based on general information provided in Section 1.0 and default model settings to estimate reasonably conservative conditions. Additional details of phasing, selection of construction equipment, and other input parameters, including CalEEMod data, are included in Appendix A.

The results of the calculations for Project construction are shown in Table 12, *Maximum Daily Construction Emissions*. The data are presented as the maximum anticipated daily emissions for comparison with the SCAQMD thresholds.

Table 12
MAXIMUM DAILY CONSTRUCTION EMISSIONS

Phase	Pollutant Emissions (pounds/day)					
	ROG	NO_X	CO	SO_2	PM_{10}[1]	$PM_{2.5}$[1]
Site Preparation	4.2	42.5	22.1	<0.1	10.5	6.5
Grading	4.8	59.8	34.0	0.1	7.1	3.9
Building Construction	4.6	36.5	33.4	0.1	6.7	2.6
Paving	1.3	13.0	15.1	<0.1	0.8	0.7
Architectural Coating	0.6	1.8	4.2	<0.1	1.0	0.3
Maximum Daily Emissions	**4.8**	**59.8**	**34.0**	**0.1**	**10.5**	**6.5**
SCAQMD Thresholds	*75*	*100*	*550*	*150*	*150*	*55*
Significant Impact?	***No***	***No***	***No***	***No***	***No***	***No***

Source: CalEEMod

1 Estimated emissions account for application of water on all unpaved roads and disturbed surface two times per day, 12% soil moisture content, and on-site speed limit of 15 mph on unpaved surfaces.
ROG = reactive organic gas; NO_X = nitrogen oxides; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10}: respirable particulate matter 10 microns or less in diameter; $PM_{2.5}$: fine particulate matter 2.5 microns or less in diameter

As shown in Table 12, emissions of all criteria pollutants related to construction of the proposed park would be below the SCAQMD significance thresholds. Therefore, the Project construction would not result in a short-term regional cumulatively considerable net increase of any criteria pollutant criteria pollutant emissions, and the impact would be less than significant.

5.2.2 Operational Emissions

Operational emissions associated with implementing the Project were estimated using CalEEMod and the defaults and assumptions as described in Section 4.1.2. Operational emission calculations and model outputs are provided in Appendix A. Table 13, *Maximum Daily Operational Emissions*, presents the summary of operational emissions for the Project.

Table 13
MAXIMUM DAILY OPERATIONAL EMISSIONS

Category	Pollutant Emissions (pounds per day)[1]					
	ROG	NO_X	CO	SO_2	PM_{10}	$PM_{2.5}$
Area	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Energy	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Mobile	0.7	6.1	8.3	<0.1	2.8	0.8
Total Daily Emissions	**0.8**	**6.1**	**8.3**	**<0.1**	**2.8**	**0.8**
SCAQMD Thresholds	*55*	*55*	*550*	*150*	*150*	*55*
Significant Impact?	***No***	***No***	***No***	***No***	***No***	***No***

Source: CalEEMod (output data is provided in Appendix A)
1 Totals may not sum due to rounding.
ROG = reactive organic gas; NO_X = nitrogen oxides; CO = carbon monoxide; SO_2 = sulfur dioxide; PM_{10}: respirable particulate matter 10 microns or less in diameter; $PM_{2.5}$: fine particulate matter 2.5 microns or less in diameter

As shown in Table 13, emissions of all criteria pollutants related to operation of the proposed park would be below the SCAQMD significance thresholds. Therefore, long-term Project operation would not result in a regional cumulatively considerable net increase of any criteria pollutant criteria pollutant emissions, and the impact would be less than significant.

5.3 IMPACTS TO SENSITIVE RECEPTORS

5.3.1 Construction Activities

5.3.1.1 Criteria Pollutants

The localized effects from the on-site portion of daily construction emissions were evaluated at sensitive receptor locations potentially impacted by the Project according to the SCAQMD's LST method, described above in Section 4.1.3. Consistent with the LST guidelines, when quantifying mass emissions for localized analysis, only emissions that occur on-site are considered. Emissions related to off-site delivery/haul truck activity and construction worker trips are not considered in the evaluation of construction-related localized impacts, as these do not contribute to emissions generated on a project site. As detailed in Section 4.1.3, the LSTs being applied to the Project are based on SRA 24, Perris Valley, receptors located within 25 meters, and a disturbed area of 5 acres. As shown in Table 14, *Maximum Localized Daily Construction Emissions*, localized emissions would not exceed the SCAQMD LSTs. Therefore, Project construction would not expose sensitive receptors to substantial criteria pollutant concentrations, and impacts would be less than significant.

Table 14
MAXIMUM LOCALIZED DAILY CONSTRUCTION EMISSIONS

Phase	Pollutant Emissions (pounds/day)			
	NO_X	CO	PM_{10}	$PM_{2.5}$
Site Preparation	42.4	21.5	10.3	6.5
Grading	50.2	32.0	6.1	3.6
Building Construction	19.2	16.8	1.1	1.1
Paving	12.9	14.7	0.7	0.6
Architectural Coating	1.5	1.8	0.1	0.1
Maximum Daily Emissions	**50.2**	**32.0**	**10.3**	**6.5**
SCAQMD LST Thresholds	*270*	*1,577*	*13*	*8*
Significant Impact?	***No***	***No***	***No***	***No***

Source: CalEEMod (output data is provided in Appendix A); SCAQMD 2009
NO_X = nitrogen oxides; CO = carbon monoxide; PM_{10}: respirable particulate matter 10 microns or less in diameter; $PM_{2.5}$: fine particulate matter 2.5 microns or less in diameter

5.3.1.2 Toxic Air Contaminants

The greatest potential for TAC emissions during construction would be related to DPM associated with heavy equipment operations during earth-moving activities. The SCAQMD does not consider diesel-related cancer risks from construction equipment to be an issue due to the short-term nature of construction activities. Individual construction activities associated with the proposed Project would be transitory and sporadic across the large site, and it is unlikely that heavy equipment would operate adjacent to any one receptor for an extended period of time. The entirety of construction would be short term in nature—lasting approximately 15 months, with the heaviest use of diesel equipment (during the site preparation and grading phases) lasting approximately 2 months. The amount of DPM to which the receptors could be exposed, which is a function of concentration and duration of exposure, is the primary factor used to determine health risk. Current models and methodologies for conducting cancer health risk assessments are associated with longer-term exposure periods (typically 30 years for individual residents) and are best suited for evaluation of long duration TAC emissions with predictable schedules and locations. Due to the variable and sporadic nature of construction activity and the anticipated short construction schedule, TAC emissions from the Project's construction activity would not expose sensitive receptors to substantial pollutant concentrations. As such, Project-related TAC emission impacts during construction would not be significant and no mitigation is required.

5.3.2 Operational Activities

5.3.2.1 CO Hotspots

CO concentration is a direct function of motor vehicle activity (e.g., idling time and traffic flow conditions) particularly during peak commute hours and meteorological conditions. Under specific meteorological conditions (e.g., stable conditions that result in poor dispersion), CO concentrations may reach unhealthy levels with respect to local sensitive land uses such as residential areas, schools, and hospitals. As a result, the SCAQMD recommends analysis of CO emissions at the local and regional levels.

A CO hotspot is an area of localized CO pollution that is caused by severe vehicle congestion on major roadways, typically near intersections. If a project increases average delay at signalized intersections operating at Level of Service (LOS) E or F or causes an intersection operating at LOS D or better without the project to operate at LOS E or F with the project, a quantitative screening is required.

The Focused Traffic Assessment prepared for the proposed Project determined that due to the relatively low traffic volume (below 50 peak hour trips) associated with Project operations, analysis of potential off-site traffic impacts was not required (Urban Crossroads 2019). As such, it can be concluded that Project-generated traffic would not increase the average delay at signalized intersections operating at LOS E of F or cause an intersection operating at LOS D or better without the Project to operate at LOS E or F with the Project. Therefore, the Project would not expose sensitive receptors to substantial pollutant concentrations as a result of CO hotspots, and the impact would be less than significant.

5.3.2.2 Toxic Air Contaminants

Long-term operation of the Project would result in some emissions of DPM from vehicles traveling to and from the Project site. However, the Project would not require the regular use of heavy or medium diesel-powered trucks (other than for occasional deliveries and waste collection) and the mix of vehicles traveling to and from the Project site would primarily be light duty autos and trucks typical of the region. Therefore, the Project would not result in significant localized concentrations of DPM. As a recreational park, the proposed Project in not anticipated to generate other long-term operational TACs. Therefore, long-term operation of the Project would not result in the exposure of sensitive receptors to substantial pollutant concentrations and the impact would be less than significant.

5.4 ODORS AND OTHER EMISSIONS

The State of California Health and Safety Code Sections 41700 and 41705, prohibit emissions from any source whatsoever in such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to the public health or damage to property. The Project could produce odors during proposed construction activities resulting from construction equipment exhaust, application of asphalt, and/or the application of architectural coatings. However, standard construction practices would minimize the odor emissions and their associated impacts. Furthermore, odors emitted during construction would be temporary, short-term, and intermittent in nature, and would cease upon the completion of the respective phase of construction.

The CARB’s Air Quality and Land Use Handbook includes a list of the most common sources of odor complaints received by local air districts. Typical sources of odor complaints include facilities such as sewage treatment plants, landfills, recycling facilities, petroleum refineries, and livestock operations (CARB 2005). The proposed Project would include a recreational park, which is not be anticipated to generate substantial odors. Therefore, the Project would not result in emissions leading to odors that would adversely affect a substantial number of people, and the impacts would be less than significant.

6.0 GREENHOUSE GAS IMPACT ANALYSIS

This section evaluates potential impacts of the proposed Project related to the generation of GHG emissions. Complete modeling results are included as Appendix A of this report.

6.1 GREENHOUSE GAS EMISSIONS

6.1.1 Construction Emissions

Project construction GHG emissions were estimated using CalEEMod, as described in Section 4.1.1. Project-specific input was based on general information provided in Section 1.0 and default model settings to estimate reasonably conservative conditions. Additional details of phasing, selection of construction equipment, and other input parameters, including CalEEMod data, are included in Appendix A.

Emissions of GHGs related to construction of the Project would be temporary. As shown in Table 15, *Estimated Constriction GHG Emissions*, total GHG emissions associated with construction of the Project are estimated at 1,361.8 MT CO_2e. For construction emissions, SCAQMD recommends that the emissions be amortized (i.e., averaged) over 30 years and added to operational emissions. Amortized over 30 years, the proposed construction activities would contribute approximately 45.4 MT CO_2e per year.

Table 15
ESTIMATED CONSTRUCTION GHG EMISSIONS

Year	Emissions (MT CO_2e)
2020	380.6
2021	981.2
Total	1,361.8
Amortized Construction Emissions	45.4

Source: CalEEMod (output data is provided in Appendix A).
[1] Construction emissions amortized over 30 years.
MT = metric tons; CO_2e = carbon dioxide equivalent

6.1.2 Operational Emissions

Operational sources of GHG emissions include: (1) area sources (landscaping equipment); (2) energy use; (3) vehicular use; (4) solid waste generation; and (5) water conveyance and treatment.

6.1.2.1 Area Source Emissions

Project area sources include emissions from use of consumer products, landscaping equipment, and VOC emissions from repainting buildings. GHG emissions associated with area sources were estimated using the CalEEMod default values for the Project. The annual GHG emissions from area sources are estimated to be less than 0.1 MT CO_2e per year.

6.1.2.2 Energy Emissions

Projects typically use energy in the forms of electricity and natural gas. Electricity generation usually entails the combustion of fossil fuels, including natural gas and coal, which is then stored and transported to end users. A facility's electricity use in thus associated with the off-site or indirect emission of GHGs at the source of the electricity generation (power plant). Natural gas emissions are generated on site. The Project may use energy for lighting within the park; however, such energy use would be minimal. The Project is not anticipated to use natural gas. The annual GHG emissions from energy consumption are estimated to be less than 0.1 MT CO_2e per year.

6.1.2.3 Vehicular (Mobile) Sources

Mobile source emissions are associated with project-related vehicle trip generation and trip length. Based on the Focused Traffic Assessment prepared for the Project, the Project is estimated to generate 90 daily trips on weekdays and 450 daily trips on weekends (Urban Crossroads 2019), resulting in 554,831 annual VMT. The annual GHG emissions from vehicular sources are estimated to be 265.2 MT CO_2e.

6.1.2.4 Solid Waste Sources

Solid waste generated by the Project would also contribute to GHG emissions. Treatment and disposal of solid waste produces methane. For the Project calculations, a countywide average waste disposal rate was used and was obtained from the California Department of Resources Recycling and Recovery (CalRecycle). This analysis assumes that the countywide average already accounts for the 50 percent diversion requirement from AB 75. In 2012, the State legislature enacted AB 341, increasing the diversion target to 75 percent statewide by 2020. Therefore, a 25 percent diversion rate over the countywide average was applied to the Project in this analysis. Using CalEEMod defaults and a 25 percent operational solid waste diversion rate in accordance with AB 341 standards, the Project is estimated to generate 1.89 tons of solid waste per year. The annual GHG emissions from solid waste sources are estimated to be 0.7 MT CO_2e.

6.1.2.5 Water Sources

Water-related GHG emissions are from the conveyance and treatment of water. The California Energy Commission's 2006 Refining Estimates of Water-Related Energy Use in California defines average energy values for water in southern California. These values are used in CalEEMod to establish default water-related emission factors. Using CalEEMod defaults and a 20 percent reduction in potable water use and wastewater generation in accordance with CALGreen, the Project's estimated annual GHG emissions related to water treatment and conveyance is 74.5 MT CO_2e.

6.1.3 Other GHG Emissions

Ozone is also a GHG; however, unlike other GHGs, ozone in the troposphere is relatively short lived and therefore is not global in nature. According to CARB, it is difficult to make an accurate determination of the contribution of ozone precursors (NO_X and VOCs) to global warming (CARB 2006). Therefore, it is assumed that emission of ozone precursors associated with the Project would not significantly contribute to climate change.

At present, there is a federal ban on chlorofluorocarbons (CFCs); therefore, it is assumed that the Project would not generate emissions of this GHG. PFCs and sulfur hexafluoride are typically used in heavy-duty industrial manufacturing applications. The proposed Project would consist of a community park and would not include heavy-duty industrial manufacturing applications. Therefore, it is not anticipated that the Project would contribute significant emissions of these GHGs.

6.1.4 Summary

Table 16, *Estimated Annual Operational Emissions,* includes the estimated total annual GHG emissions for the Project. The emissions include the amortized annual construction emissions anticipated for the Project. Appendix A contains the CalEEMod output files for the Project. As shown in Table 16, the Project would result in annual GHG emissions of 385.8 MT CO_2e. This value is less than the SCAQMD's 2,709 MT CO_2e per year interim threshold adjusted for consistency with SB 32. Therefore, GHG emissions during Project operation, including amortized construction emissions, would be less than significant.

Table 16
ESTIMATED ANNUAL OPERATIONAL GHG EMISSIONS

Emission Sources	Emissions (MT CO_2e per year)
	2021
Area Sources	<0.1
Energy Sources	<0.1
Vehicular (Mobile) Sources	265.2
Solid Waste Sources	0.7
Water Sources	74.5
Operational Subtotal	*340.4*
Construction (Annualized over 30 years)	45.4
Total Emissions[1]	**385.8**
SCAQMD Threshold	2,709
Exceed Threshold	***No***

Source: CalEEMod output data is provided in Appendix A
[1] Totals may not sum due to rounding.
MT = metric tons; CO_2e = carbon dioxide equivalent

6.2 CONSISTENCY WITH LOCAL PLANS ADOPTED FOR THE PURPOSE OF REDUCING GHG EMISSIONS

There are numerous State plans, policies, and regulations adopted for the purpose of reducing GHG emissions. The principal overall State plan and policy is AB 32, the California Global Warming Solutions Act of 2006. The quantitative goal of AB 32 is to reduce GHG emissions to 1990 levels by 2020. SB 32 would require further reductions of 40 percent below 1990 levels by 2030. Because the Project would become operational after 2020, the Project aims to reach the quantitative goals set by SB 32. As shown in Table 16, the Project's emissions would be well below the SCAQMD threshold adjusted for compliance with SB 32. Statewide plans and regulations such as GHG emissions standards for vehicles (AB 1493), the LCFS, and regulations requiring an increasing fraction of electricity to be generated from renewable sources are being implemented at the statewide level; as such, compliance at the project level is not addressed. Therefore, the proposed Project does not conflict with those plans and regulations.

As previously discussed, the proposed Project's increase in GHG emissions would be less than the screening threshold being applied to this analysis. In addition, the bicycle trails provided would be consistent with the City's CAP Measure T-1, Bicycle Infrastructure Improvements, and by providing a recreational use in proximity to existing residences, the Project would be consistent with Measure T-7, Mixed-Use Development. Implementation of the proposed Project would not conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions, and the impact would be less than significant impact.

7.0 REFERENCES

California Air Resources Board (CARB). 2019a. Top 4 Measurements and Days Above the Standard. Available at: http://www.arb.ca.gov/adam/topfour/topfour1.php. Accessed December 16, 2019.

2019b. GHG Current California Emission Inventory Data. Available at: https://ww2.arb.ca.gov/ghg-inventory-data.

2018. Overview: Diesel Exhaust and Health. Available at: https://ww2.arb.ca.gov/resources/overview-diesel-exhaust-and-health.

2017. The 2017 Climate Change Scoping Plan Update. 2017. https://www.arb.ca.gov/cc/scopingplan/2030sp_pp_final.pdf. January 20, 2017

2016. Ambient Air Quality Standards. May 4. Available at: http://www.arb.ca.gov/research/aaqs/aaqs2.pdf.

2013. Clean Car Standards – Pavley, Assembly Bill 1493. Accessed September 2014. Available at: http://www.arb.ca.gov/cc/ccms/ccms.htm.

2007. California 1990 Greenhouse Gas Emissions Level and 2020 Emissions Limit. November 16.

2006. Public Workshop to Discuss Establishing the 1990 Emission Level and the California 2020 Limit and Developing Regulations to Require Reporting of Greenhouse Gas Emissions, Sacramento, CA. December 1.

2005. Air Quality and Land Use Handbook: A Community Health Perspective. November. Available at: https://www.arb.ca.gov/ch/handbook.pdf.

2000. Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles. October.

California Building Standards Commission (CBSC). 2017. 2016 California Green (CALGreen) Building Standards and Mandatory Checklist. Effective January 2017. Available at: http://www.bsc.ca.gov/Home/CALGreen.aspx.

California Pollution Control Officers Association (CAPCOA). 2019. Health Effects. Available at: http://www.capcoa.org/health-effects/. Accessed March 1, 2019.

2017. User's Guide for CalEEMod Version 2016.3.2. Available at: http://www.caleemod.com/.

Intergovernmental Panel on Climate Change (IPCC). 2014. Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

2013. Climate Change 2013: The Physical Science Basis. Working Group I Contribution to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.

Intergovernmental Panel on Climate Change (IPCC) (cont.)
2007. Climate Change 2007: The Physical Science Basis. Summary for Policymakers. Contribution of Working Group I to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. February.

National Oceanic and Atmospheric Administration. 2019. Trends in Atmospheric Carbon Dioxide. Available at: https://www.esrl.noaa.gov/gmd/ccgg/trends/index.html. Accessed December 20, 2019.

National Aeronautics and Space Administration, Goddard Institute for Space Studies. 2018. NASA News & Features Releases. Long-Term Warming Trend Continued in 2017: NASA, NOAA. https://www.giss.nasa.gov/research/news/20180118/.

Perris, City of. 2016. City of Perris Climate Action Plan. February 23.

South Coast Air Quality Management District (SCAQMD). 2017. Final 2016 Air Quality Management Plan. Available: https://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/final-2016-aqmp. March.

2016. National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) Attainment Status for South Coast Air Basin. Available: http://www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/naaqs-caaqs-feb2016.pdf. November.

2015. South Coast Air Quality Management District Air Quality Significance Thresholds. Available from: http://www.aqmd.gov/docs/default-source/ceqa/handbook/scaqmd-air-quality-significance-thresholds.pdf?sfvrsn=2.

2010. Greenhouse Gas CEQA Significance Threshold Stakeholder Working Group Meeting #15 (slide presentation). Diamond Bar, CA. SCAQMD. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/greenhouse-gases-(ghg)-ceqasignificance-thresholds/year-2008-2009/ghg-meeting-15/ghg-meeting-15-mainpresentation.pdf. September 28.

2009. Mass Rate Localized Significance Thresholds Look-up Tables. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/appendix-c-mass-rate-lst-look-up-tables.pdf?sfvrsn=2. October.

2008. Localized Significance Threshold Methodology. Available at: http://www.aqmd.gov/docs/default-source/ceqa/handbook/localized-significance-thresholds/final-lst-methodology-document.pdf?sfvrsn=2.

2005. Rule 403. Fugitive dust. June. Available at: https://www.aqmd.gov/docs/default-source/rule-book/rule-iv/rule-403.pdf?sfvrsn=4.

2016. 2016-2040 Regional Transportation Plan/ Sustainable Communities Strategy. Available at: http://scagrtpscs.net/Pages/FINAL2016RTPSCS.aspx.

Urban Crossroads. 2019. Enchanted Hills Park Focused Traffic Assessment. December 13.

U.S. Environmental Protection Agency (USEPA). 2017. Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases under the Clean Air Act. Last updated July 7. Available at: https://www.epa.gov/ghgemissions/endangerment-and-cause-or-contribute-findings-greenhouse-gases-under-section-202a-clean.

2015. Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2013. Available at: https://www.epa.gov/sites/production/files/2016-03/documents/us-ghg-inventory-2015-chapter-executive-summary.pdf.

U.S. Environmental Protection Agency and U.S. Department of Transportation, National Highway Traffic Safety Administration. 2018. The Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule for Model Years 2021-2026 Passenger Cars and Light Trucks. August 24. Available at: https://www.govinfo.gov/content/pkg/FR-2018-08-24/pdf/2018-16820.pdf

2012. 2017 and Later Model Year Light-Duty Vehicle Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards. October 15. Available at: https://one.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/2017-25_CAFE_Final_Rule.pdf.

Western Regional Climate Center (WRRC). 2017. Period of Record Monthly Climate Summary, Elsinore California (042805). Available from: https://wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca2805.

Western Riverside Council of Governments. 2014. Subregional Climate Action Plan. Available from: http://www.wrcog.cog.ca.us/DocumentCenter/View/188/Subregional-Climate-Action-Plan-CAP-PDF?bidId=.

8.0 LIST OF PREPARERS

Hunter Stapp	Air Quality Analyst
Victor Ortiz	Senior Air Quality Specialist
Kara Palm	Project Manager

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Appendix A

CalEEMod Output

COP-04 Enchanted Hills Park

Riverside-South Coast County, Winter

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	22.00	Acre	22.00	958,320.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Default phasing with Building Construction phase reduced based on limited structures to be provided.

Grading -

Vehicle Trips - Urban Crossroads 2019

Construction Off-road Equipment Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	370.00	238.00
tblConstructionPhase	PhaseEndDate	6/27/2022	11/25/2021
tblConstructionPhase	PhaseEndDate	5/2/2022	9/30/2021
tblConstructionPhase	PhaseEndDate	11/30/2020	11/2/2020
tblConstructionPhase	PhaseEndDate	5/30/2022	10/28/2021
tblConstructionPhase	PhaseEndDate	10/12/2020	9/14/2020
tblConstructionPhase	PhaseStartDate	5/31/2022	10/29/2021
tblConstructionPhase	PhaseStartDate	12/1/2020	11/3/2020
tblConstructionPhase	PhaseStartDate	10/13/2020	9/15/2020
tblConstructionPhase	PhaseStartDate	5/3/2022	10/1/2021
tblConstructionPhase	PhaseStartDate	9/29/2020	9/1/2020
tblGrading	MaterialExported	0.00	11,200.00
tblVehicleTrips	ST_TR	22.75	20.45
tblVehicleTrips	SU_TR	16.74	20.45
tblVehicleTrips	WD_TR	1.89	4.09

2.0 Emissions Summary

2.1 Overall Construction (Maximum Daily Emission)

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.7662	59.8141	33.9794	0.1063	18.2675	2.2059	20.4661	9.9840	2.0305	12.0068	0.0000	10,686.9423	10,686.9423	2.1581	0.0000	10,714.0023
2021	4.1605	32.9585	31.6385	0.1046	5.4987	1.0136	6.5123	1.4811	0.9529	2.4340	0.0000	10,521.9215	10,521.9215	1.0467	0.0000	10,548.0895
Maximum	**4.7662**	**59.8141**	**33.9794**	**0.1063**	**18.2675**	**2.2059**	**20.4661**	**9.9840**	**2.0305**	**12.0068**	**0.0000**	**10,686.9423**	**10,686.9423**	**2.1581**	**0.0000**	**10,714.0023**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	lb/day										lb/day					
2020	4.7662	59.8141	33.9794	0.1063	8.3310	2.2059	10.5297	4.5222	2.0305	6.5449	0.0000	10,686.9423	10,686.9423	2.1581	0.0000	10,714.0023
2021	4.1605	32.9585	31.6385	0.1046	5.4987	1.0136	6.5123	1.4811	0.9529	2.4340	0.0000	10,521.9215	10,521.9215	1.0467	0.0000	10,548.0895
Maximum	**4.7662**	**59.8141**	**33.9794**	**0.1063**	**8.3310**	**2.2059**	**10.5297**	**4.5222**	**2.0305**	**6.5449**	**0.0000**	**10,686.9423**	**10,686.9423**	**2.1581**	**0.0000**	**10,714.0023**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**41.81**	**0.00**	**36.83**	**47.64**	**0.00**	**37.82**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0496	2.0000e-005	2.2500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.8100e-003	4.8100e-003	1.0000e-005		5.1300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.7276	6.0512	8.2816	0.0358	2.7611	0.0270	2.7881	0.7388	0.0253	0.7641		3,656.2599	3,656.2599	0.2107		3,661.5266
Total	**0.7772**	**6.0513**	**8.2839**	**0.0358**	**2.7611**	**0.0270**	**2.7881**	**0.7388**	**0.0254**	**0.7641**		**3,656.2647**	**3,656.2647**	**0.2107**	**0.0000**	**3,661.5318**

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Area	0.0496	2.0000e-005	2.2500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.8100e-003	4.8100e-003	1.0000e-005		5.1300e-003
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.7276	6.0512	8.2816	0.0358	2.7611	0.0270	2.7881	0.7388	0.0253	0.7641		3,656.2599	3,656.2599	0.2107		3,661.5266
Total	**0.7772**	**6.0513**	**8.2839**	**0.0358**	**2.7611**	**0.0270**	**2.7881**	**0.7388**	**0.0254**	**0.7641**		**3,656.2647**	**3,656.2647**	**0.2107**	**0.0000**	**3,661.5318**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2020	9/14/2020	5	10	
2	Grading	Grading	9/15/2020	11/2/2020	5	35	
3	Building Construction	Building Construction	11/3/2020	9/30/2021	5	238	
4	Paving	Paving	10/1/2021	10/28/2021	5	20	
5	Architectural Coating	Architectural Coating	10/29/2021	11/25/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 87.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

COP-04 Enchanted Hills Park - Riverside-South Coast County, Winter

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	1,400.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	402.00	157.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	80.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					18.0663	0.0000	18.0663	9.9307	0.0000	9.9307			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216		3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**18.0663**	**2.1974**	**20.2637**	**9.9307**	**2.0216**	**11.9523**		**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.2 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0897	0.0560	0.5871	1.7900e-003	0.2012	1.2200e-003	0.2024	0.0534	1.1200e-003	0.0545		177.8824	177.8824	4.4200e-003		177.9929
Total	**0.0897**	**0.0560**	**0.5871**	**1.7900e-003**	**0.2012**	**1.2200e-003**	**0.2024**	**0.0534**	**1.1200e-003**	**0.0545**		**177.8824**	**177.8824**	**4.4200e-003**		**177.9929**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.1298	0.0000	8.1298	4.4688	0.0000	4.4688			0.0000			0.0000
Off-Road	4.0765	42.4173	21.5136	0.0380		2.1974	2.1974		2.0216	2.0216	0.0000	3,685.1016	3,685.1016	1.1918		3,714.8975
Total	**4.0765**	**42.4173**	**21.5136**	**0.0380**	**8.1298**	**2.1974**	**10.3272**	**4.4688**	**2.0216**	**6.4904**	**0.0000**	**3,685.1016**	**3,685.1016**	**1.1918**		**3,714.8975**

3.2 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0897	0.0560	0.5871	1.7900e-003	0.2012	1.2200e-003	0.2024	0.0534	1.1200e-003	0.0545		177.8824	177.8824	4.4200e-003		177.9929
Total	**0.0897**	**0.0560**	**0.5871**	**1.7900e-003**	**0.2012**	**1.2200e-003**	**0.2024**	**0.0534**	**1.1200e-003**	**0.0545**		**177.8824**	**177.8824**	**4.4200e-003**		**177.9929**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					8.7139	0.0000	8.7139	3.6026	0.0000	3.6026			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000		6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**8.7139**	**2.1739**	**10.8878**	**3.6026**	**2.0000**	**5.6026**		**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2164	9.5543	1.3687	0.0297	0.6998	0.0306	0.7304	0.1918	0.0293	0.2211		3,150.2313	3,150.2313	0.2108		3,155.5003
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0997	0.0623	0.6524	1.9800e-003	0.2236	1.3500e-003	0.2249	0.0593	1.2500e-003	0.0605		197.6472	197.6472	4.9100e-003		197.7699
Total	**0.3161**	**9.6165**	**2.0211**	**0.0317**	**0.9233**	**0.0320**	**0.9553**	**0.2511**	**0.0305**	**0.2816**		**3,347.8784**	**3,347.8784**	**0.2157**		**3,353.2702**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Fugitive Dust					3.9212	0.0000	3.9212	1.6212	0.0000	1.6212			0.0000			0.0000
Off-Road	4.4501	50.1975	31.9583	0.0620		2.1739	2.1739		2.0000	2.0000	0.0000	6,005.8653	6,005.8653	1.9424		6,054.4257
Total	**4.4501**	**50.1975**	**31.9583**	**0.0620**	**3.9212**	**2.1739**	**6.0951**	**1.6212**	**2.0000**	**3.6212**	**0.0000**	**6,005.8653**	**6,005.8653**	**1.9424**		**6,054.4257**

3.3 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.2164	9.5543	1.3687	0.0297	0.6998	0.0306	0.7304	0.1918	0.0293	0.2211		3,150.2313	3,150.2313	0.2108		3,155.5003
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0997	0.0623	0.6524	1.9800e-003	0.2236	1.3500e-003	0.2249	0.0593	1.2500e-003	0.0605		197.6472	197.6472	4.9100e-003		197.7699
Total	**0.3161**	**9.6165**	**2.0211**	**0.0317**	**0.9233**	**0.0320**	**0.9553**	**0.2511**	**0.0305**	**0.2816**		**3,347.8784**	**3,347.8784**	**0.2157**		**3,353.2702**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503		2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**		**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4616	16.0694	3.4603	0.0395	1.0054	0.0930	1.0983	0.2895	0.0889	0.3784		4,161.1714	4,161.1714	0.3609		4,170.1931
Worker	2.0034	1.2516	13.1122	0.0399	4.4934	0.0272	4.5206	1.1917	0.0251	1.2167		3,972.7079	3,972.7079	0.0987		3,975.1747
Total	**2.4649**	**17.3210**	**16.5725**	**0.0794**	**5.4988**	**0.1202**	**5.6190**	**1.4811**	**0.1140**	**1.5951**		**8,133.8793**	**8,133.8793**	**0.4595**		**8,145.3678**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	2.1198	19.1860	16.8485	0.0269		1.1171	1.1171		1.0503	1.0503	0.0000	2,553.0631	2,553.0631	0.6229		2,568.6345
Total	**2.1198**	**19.1860**	**16.8485**	**0.0269**		**1.1171**	**1.1171**		**1.0503**	**1.0503**	**0.0000**	**2,553.0631**	**2,553.0631**	**0.6229**		**2,568.6345**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.4616	16.0694	3.4603	0.0395	1.0054	0.0930	1.0983	0.2895	0.0889	0.3784		4,161.171 4	4,161.171 4	0.3609		4,170.193 1
Worker	2.0034	1.2516	13.1122	0.0399	4.4934	0.0272	4.5206	1.1917	0.0251	1.2167		3,972.707 9	3,972.707 9	0.0987		3,975.174 7
Total	**2.4649**	**17.3210**	**16.5725**	**0.0794**	**5.4988**	**0.1202**	**5.6190**	**1.4811**	**0.1140**	**1.5951**		**8,133.879 3**	**8,133.879 3**	**0.4595**		**8,145.367 8**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013		2,553.363 9	2,553.363 9	0.6160		2,568.764 3
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**		**2,553.363 9**	**2,553.363 9**	**0.6160**		**2,568.764 3**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3893	14.4035	3.0664	0.0392	1.0053	0.0285	1.0338	0.2895	0.0272	0.3167		4,128.679 5	4,128.679 5	0.3420		4,137.228 9
Worker	1.8703	1.1229	11.9969	0.0385	4.4934	0.0265	4.5199	1.1917	0.0244	1.2161		3,839.878 1	3,839.878 1	0.0887		3,842.096 4
Total	**2.2596**	**15.5264**	**15.0633**	**0.0777**	**5.4987**	**0.0550**	**5.5537**	**1.4811**	**0.0516**	**1.5327**		**7,968.557 6**	**7,968.557 6**	**0.4307**		**7,979.325 3**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.9009	17.4321	16.5752	0.0269		0.9586	0.9586		0.9013	0.9013	0.0000	2,553.363 9	2,553.363 9	0.6160		2,568.764 3
Total	**1.9009**	**17.4321**	**16.5752**	**0.0269**		**0.9586**	**0.9586**		**0.9013**	**0.9013**	**0.0000**	**2,553.363 9**	**2,553.363 9**	**0.6160**		**2,568.764 3**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.3893	14.4035	3.0664	0.0392	1.0053	0.0285	1.0338	0.2895	0.0272	0.3167		4,128.6795	4,128.6795	0.3420		4,137.2289
Worker	1.8703	1.1229	11.9969	0.0385	4.4934	0.0265	4.5199	1.1917	0.0244	1.2161		3,839.8781	3,839.8781	0.0887		3,842.0964
Total	**2.2596**	**15.5264**	**15.0633**	**0.0777**	**5.4987**	**0.0550**	**5.5537**	**1.4811**	**0.0516**	**1.5327**		**7,968.5576**	**7,968.5576**	**0.4307**		**7,979.3253**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235		2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2556**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**		**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

3.5 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0698	0.0419	0.4476	1.4400e-003	0.1677	9.9000e-004	0.1687	0.0445	9.1000e-004	0.0454		143.2790	143.2790	3.3100e-003		143.3618
Total	**0.0698**	**0.0419**	**0.4476**	**1.4400e-003**	**0.1677**	**9.9000e-004**	**0.1687**	**0.0445**	**9.1000e-004**	**0.0454**		**143.2790**	**143.2790**	**3.3100e-003**		**143.3618**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Off-Road	1.2556	12.9191	14.6532	0.0228		0.6777	0.6777		0.6235	0.6235	0.0000	2,207.2109	2,207.2109	0.7139		2,225.0573
Paving	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Total	**1.2556**	**12.9191**	**14.6532**	**0.0228**		**0.6777**	**0.6777**		**0.6235**	**0.6235**	**0.0000**	**2,207.2109**	**2,207.2109**	**0.7139**		**2,225.0573**

3.5 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.0698	0.0419	0.4476	1.4400e-003	0.1677	9.9000e-004	0.1687	0.0445	9.1000e-004	0.0454		143.2790	143.2790	3.3100e-003		143.3618
Total	**0.0698**	**0.0419**	**0.4476**	**1.4400e-003**	**0.1677**	**9.9000e-004**	**0.1687**	**0.0445**	**9.1000e-004**	**0.0454**		**143.2790**	**143.2790**	**3.3100e-003**		**143.3618**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941		281.4481	281.4481	0.0193		281.9309
Total	**0.2189**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**		**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.6 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3722	0.2235	2.3874	7.6700e-003	0.8942	5.2700e-003	0.8995	0.2372	4.8500e-003	0.2420		764.1548	764.1548	0.0177		764.5963
Total	**0.3722**	**0.2235**	**2.3874**	**7.6700e-003**	**0.8942**	**5.2700e-003**	**0.8995**	**0.2372**	**4.8500e-003**	**0.2420**		**764.1548**	**764.1548**	**0.0177**		**764.5963**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Off-Road	0.2189	1.5268	1.8176	2.9700e-003		0.0941	0.0941		0.0941	0.0941	0.0000	281.4481	281.4481	0.0193		281.9309
Total	**0.2189**	**1.5268**	**1.8176**	**2.9700e-003**		**0.0941**	**0.0941**		**0.0941**	**0.0941**	**0.0000**	**281.4481**	**281.4481**	**0.0193**		**281.9309**

3.6 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000	0.0000		0.0000
Worker	0.3722	0.2235	2.3874	7.6700e-003	0.8942	5.2700e-003	0.8995	0.2372	4.8500e-003	0.2420		764.1548	764.1548	0.0177		764.5963
Total	**0.3722**	**0.2235**	**2.3874**	**7.6700e-003**	**0.8942**	**5.2700e-003**	**0.8995**	**0.2372**	**4.8500e-003**	**0.2420**		**764.1548**	**764.1548**	**0.0177**		**764.5963**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.7276	6.0512	8.2816	0.0358	2.7611	0.0270	2.7881	0.7388	0.0253	0.7641		3,656.2599	3,656.2599	0.2107		3,661.5266
Unmitigated	0.7276	6.0512	8.2816	0.0358	2.7611	0.0270	2.7881	0.7388	0.0253	0.7641		3,656.2599	3,656.2599	0.2107		3,661.5266

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	89.98	449.90	449.90	554,831	554,831
Total	89.98	449.90	449.90	554,831	554,831

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.542116	0.037578	0.185203	0.118503	0.016241	0.005141	0.017392	0.068695	0.001383	0.001183	0.004582	0.000945	0.001038

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	lb/day										lb/day					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	lb/day										lb/day					
Mitigated	0.0496	2.0000e-005	2.2500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.8100e-003	4.8100e-003	1.0000e-005		5.1300e-003
Unmitigated	0.0496	2.0000e-005	2.2500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.8100e-003	4.8100e-003	1.0000e-005		5.1300e-003

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0494					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.1000e-004	2.0000e-005	2.2500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.8100e-003	4.8100e-003	1.0000e-005		5.1300e-003
Total	**0.0496**	**2.0000e-005**	**2.2500e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**4.8100e-003**	**4.8100e-003**	**1.0000e-005**		**5.1300e-003**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	lb/day										lb/day					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Consumer Products	0.0494					0.0000	0.0000		0.0000	0.0000			0.0000			0.0000
Landscaping	2.1000e-004	2.0000e-005	2.2500e-003	0.0000		1.0000e-005	1.0000e-005		1.0000e-005	1.0000e-005		4.8100e-003	4.8100e-003	1.0000e-005		5.1300e-003
Total	**0.0496**	**2.0000e-005**	**2.2500e-003**	**0.0000**		**1.0000e-005**	**1.0000e-005**		**1.0000e-005**	**1.0000e-005**		**4.8100e-003**	**4.8100e-003**	**1.0000e-005**		**5.1300e-003**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

COP-04 Enchanted Hills Park

Riverside-South Coast County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
City Park	22.00	Acre	22.00	958,320.00	0

1.2 Other Project Characteristics

Urbanization	Urban	**Wind Speed (m/s)**	2.4	**Precipitation Freq (Days)**	28
Climate Zone	10			**Operational Year**	2021
Utility Company	Southern California Edison				
CO2 Intensity (lb/MWhr)	702.44	**CH4 Intensity (lb/MWhr)**	0.029	**N2O Intensity (lb/MWhr)**	0.006

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use -

Construction Phase - Default phasing with Building Construction phase reduced based on limited structures to be provided.

Grading -

Vehicle Trips - Urban Crossroads 2019

Construction Off-road Equipment Mitigation -

Water Mitigation -

Waste Mitigation -

Table Name	Column Name	Default Value	New Value
tblConstDustMitigation	WaterUnpavedRoadMoistureContent	0	12
tblConstDustMitigation	WaterUnpavedRoadVehicleSpeed	0	15
tblConstructionPhase	NumDays	370.00	238.00
tblConstructionPhase	PhaseEndDate	6/27/2022	11/25/2021
tblConstructionPhase	PhaseEndDate	5/2/2022	9/30/2021
tblConstructionPhase	PhaseEndDate	11/30/2020	11/2/2020
tblConstructionPhase	PhaseEndDate	5/30/2022	10/28/2021
tblConstructionPhase	PhaseEndDate	10/12/2020	9/14/2020
tblConstructionPhase	PhaseStartDate	5/31/2022	10/29/2021
tblConstructionPhase	PhaseStartDate	12/1/2020	11/3/2020
tblConstructionPhase	PhaseStartDate	10/13/2020	9/15/2020
tblConstructionPhase	PhaseStartDate	5/3/2022	10/1/2021
tblConstructionPhase	PhaseStartDate	9/29/2020	9/1/2020
tblGrading	MaterialExported	0.00	11,200.00
tblVehicleTrips	ST_TR	22.75	20.45
tblVehicleTrips	SU_TR	16.74	20.45
tblVehicleTrips	WD_TR	1.89	4.09

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1989	2.0531	1.4321	4.1700e-003	0.3761	0.0762	0.4522	0.1487	0.0707	0.2193	0.0000	379.1415	379.1415	0.0603	0.0000	380.6490
2021	0.4087	3.3874	3.3192	0.0107	0.5379	0.1066	0.6445	0.1451	0.1001	0.2452	0.0000	978.7124	978.7124	0.0979	0.0000	981.1609
Maximum	**0.4087**	**3.3874**	**3.3192**	**0.0107**	**0.5379**	**0.1066**	**0.6445**	**0.1487**	**0.1001**	**0.2452**	**0.0000**	**978.7124**	**978.7124**	**0.0979**	**0.0000**	**981.1609**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2020	0.1989	2.0531	1.4321	4.1700e-003	0.2425	0.0762	0.3187	0.0867	0.0707	0.1574	0.0000	379.1414	379.1414	0.0603	0.0000	380.6488
2021	0.4087	3.3874	3.3192	0.0107	0.5379	0.1066	0.6445	0.1451	0.1001	0.2452	0.0000	978.7121	978.7121	0.0979	0.0000	981.1606
Maximum	**0.4087**	**3.3874**	**3.3192**	**0.0107**	**0.5379**	**0.1066**	**0.6445**	**0.1451**	**0.1001**	**0.2452**	**0.0000**	**978.7121**	**978.7121**	**0.0979**	**0.0000**	**981.1606**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**14.61**	**0.00**	**12.18**	**21.10**	**0.00**	**13.35**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**9-1-2020**	**11-30-2020**	1.7737	1.7737
2	**12-1-2020**	**2-28-2021**	1.2371	1.2371
3	**3-1-2021**	**5-31-2021**	1.2218	1.2218
4	**6-1-2021**	**8-31-2021**	1.2229	1.2229
5	**9-1-2021**	**9-30-2021**	0.3988	0.3988
		Highest	1.7737	1.7737

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	9.0400e-003	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.5000e-004	5.5000e-004	0.0000	0.0000	5.8000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0568	0.4804	0.6636	2.8600e-003	0.2119	2.0900e-003	0.2139	0.0568	1.9600e-003	0.0587	0.0000	264.8292	264.8292	0.0144	0.0000	265.1901
Waste						0.0000	0.0000		0.0000	0.0000	0.3837	0.0000	0.3837	0.0227	0.0000	0.9505
Water						0.0000	0.0000		0.0000	0.0000	0.0000	92.7895	92.7895	3.8300e-003	7.9000e-004	93.1215
Total	**0.0658**	**0.4804**	**0.6639**	**2.8600e-003**	**0.2119**	**2.0900e-003**	**0.2139**	**0.0568**	**1.9600e-003**	**0.0587**	**0.3837**	**357.6193**	**358.0029**	**0.0409**	**7.9000e-004**	**359.2627**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	9.0400e-003	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.5000e-004	5.5000e-004	0.0000	0.0000	5.8000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0568	0.4804	0.6636	2.8600e-003	0.2119	2.0900e-003	0.2139	0.0568	1.9600e-003	0.0587	0.0000	264.8292	264.8292	0.0144	0.0000	265.1901
Waste						0.0000	0.0000		0.0000	0.0000	0.2877	0.0000	0.2877	0.0170	0.0000	0.7129
Water						0.0000	0.0000		0.0000	0.0000	0.0000	74.2316	74.2316	3.0600e-003	6.3000e-004	74.4972
Total	**0.0658**	**0.4804**	**0.6639**	**2.8600e-003**	**0.2119**	**2.0900e-003**	**0.2139**	**0.0568**	**1.9600e-003**	**0.0587**	**0.2877**	**339.0614**	**339.3491**	**0.0345**	**6.3000e-004**	**340.4008**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**25.00**	**5.19**	**5.21**	**15.73**	**20.25**	**5.25**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Site Preparation	Site Preparation	9/1/2020	9/14/2020	5	10	
2	Grading	Grading	9/15/2020	11/2/2020	5	35	
3	Building Construction	Building Construction	11/3/2020	9/30/2021	5	238	
4	Paving	Paving	10/1/2021	10/28/2021	5	20	
5	Architectural Coating	Architectural Coating	10/29/2021	11/25/2021	5	20	

Acres of Grading (Site Preparation Phase): 0

Acres of Grading (Grading Phase): 87.5

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 0; Non-Residential Outdoor: 0; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Grading	Excavators	2	8.00	158	0.38
Building Construction	Cranes	1	7.00	231	0.29
Building Construction	Forklifts	3	8.00	89	0.20
Building Construction	Generator Sets	1	8.00	84	0.74
Paving	Pavers	2	8.00	130	0.42
Paving	Rollers	2	8.00	80	0.38
Grading	Rubber Tired Dozers	1	8.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	3	7.00	97	0.37
Grading	Graders	1	8.00	187	0.41
Grading	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Paving	Paving Equipment	2	8.00	132	0.36
Site Preparation	Tractors/Loaders/Backhoes	4	8.00	97	0.37
Site Preparation	Rubber Tired Dozers	3	8.00	247	0.40
Grading	Scrapers	2	8.00	367	0.48
Building Construction	Welders	1	8.00	46	0.45

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Site Preparation	7	18.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Grading	8	20.00	0.00	1,400.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	9	402.00	157.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Paving	6	15.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	80.00	0.00	0.00	14.70	6.90	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

Water Exposed Area

Water Unpaved Roads

Reduce Vehicle Speed on Unpaved Roads

3.2 Site Preparation - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0903	0.0000	0.0903	0.0497	0.0000	0.0497	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.0903**	**0.0110**	**0.1013**	**0.0497**	**0.0101**	**0.0598**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

3.2 Site Preparation - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	2.9000e-004	3.0900e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8276	0.8276	2.0000e-005	0.0000	0.8282
Total	**4.1000e-004**	**2.9000e-004**	**3.0900e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8276**	**0.8276**	**2.0000e-005**	**0.0000**	**0.8282**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0407	0.0000	0.0407	0.0223	0.0000	0.0223	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0204	0.2121	0.1076	1.9000e-004		0.0110	0.0110		0.0101	0.0101	0.0000	16.7153	16.7153	5.4100e-003	0.0000	16.8505
Total	**0.0204**	**0.2121**	**0.1076**	**1.9000e-004**	**0.0407**	**0.0110**	**0.0516**	**0.0223**	**0.0101**	**0.0325**	**0.0000**	**16.7153**	**16.7153**	**5.4100e-003**	**0.0000**	**16.8505**

3.2 Site Preparation - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	4.1000e-004	2.9000e-004	3.0900e-003	1.0000e-005	9.9000e-004	1.0000e-005	1.0000e-003	2.6000e-004	1.0000e-005	2.7000e-004	0.0000	0.8276	0.8276	2.0000e-005	0.0000	0.8282
Total	**4.1000e-004**	**2.9000e-004**	**3.0900e-003**	**1.0000e-005**	**9.9000e-004**	**1.0000e-005**	**1.0000e-003**	**2.6000e-004**	**1.0000e-005**	**2.7000e-004**	**0.0000**	**0.8276**	**0.8276**	**2.0000e-005**	**0.0000**	**0.8282**

3.3 Grading - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.1525	0.0000	0.1525	0.0631	0.0000	0.0631	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0779	0.8785	0.5593	1.0900e-003		0.0380	0.0380		0.0350	0.0350	0.0000	95.3475	95.3475	0.0308	0.0000	96.1185
Total	**0.0779**	**0.8785**	**0.5593**	**1.0900e-003**	**0.1525**	**0.0380**	**0.1905**	**0.0631**	**0.0350**	**0.0981**	**0.0000**	**95.3475**	**95.3475**	**0.0308**	**0.0000**	**96.1185**

3.3 Grading - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.6800e-003	0.1697	0.0220	5.3000e-004	0.0121	5.3000e-004	0.0126	3.3100e-003	5.1000e-004	3.8200e-003	0.0000	50.7566	50.7566	3.1800e-003	0.0000	50.8361
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6100e-003	1.1300e-003	0.0120	4.0000e-005	3.8500e-003	2.0000e-005	3.8700e-003	1.0200e-003	2.0000e-005	1.0400e-003	0.0000	3.2186	3.2186	8.0000e-005	0.0000	3.2206
Total	**5.2900e-003**	**0.1709**	**0.0340**	**5.7000e-004**	**0.0159**	**5.5000e-004**	**0.0165**	**4.3300e-003**	**5.3000e-004**	**4.8600e-003**	**0.0000**	**53.9752**	**53.9752**	**3.2600e-003**	**0.0000**	**54.0567**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					0.0686	0.0000	0.0686	0.0284	0.0000	0.0284	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	0.0779	0.8785	0.5593	1.0900e-003		0.0380	0.0380		0.0350	0.0350	0.0000	95.3474	95.3474	0.0308	0.0000	96.1183
Total	**0.0779**	**0.8785**	**0.5593**	**1.0900e-003**	**0.0686**	**0.0380**	**0.1067**	**0.0284**	**0.0350**	**0.0634**	**0.0000**	**95.3474**	**95.3474**	**0.0308**	**0.0000**	**96.1183**

3.3 Grading - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	3.6800e-003	0.1697	0.0220	5.3000e-004	0.0121	5.3000e-004	0.0126	3.3100e-003	5.1000e-004	3.8200e-003	0.0000	50.7566	50.7566	3.1800e-003	0.0000	50.8361
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.6100e-003	1.1300e-003	0.0120	4.0000e-005	3.8500e-003	2.0000e-005	3.8700e-003	1.0200e-003	2.0000e-005	1.0400e-003	0.0000	3.2186	3.2186	8.0000e-005	0.0000	3.2206
Total	**5.2900e-003**	**0.1709**	**0.0340**	**5.7000e-004**	**0.0159**	**5.5000e-004**	**0.0165**	**4.3300e-003**	**5.3000e-004**	**4.8600e-003**	**0.0000**	**53.9752**	**53.9752**	**3.2600e-003**	**0.0000**	**54.0567**

3.4 Building Construction - 2020

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0456	0.4125	0.3622	5.8000e-004		0.0240	0.0240		0.0226	0.0226	0.0000	49.7962	49.7962	0.0122	0.0000	50.0999
Total	**0.0456**	**0.4125**	**0.3622**	**5.8000e-004**		**0.0240**	**0.0240**		**0.0226**	**0.0226**	**0.0000**	**49.7962**	**49.7962**	**0.0122**	**0.0000**	**50.0999**

3.4 Building Construction - 2020

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5900e-003	0.3511	0.0687	8.7000e-004	0.0213	1.9900e-003	0.0233	6.1500e-003	1.9000e-003	8.0500e-003	0.0000	82.9994	82.9994	6.6300e-003	0.0000	83.1653
Worker	0.0397	0.0278	0.2972	8.8000e-004	0.0950	5.8000e-004	0.0956	0.0252	5.4000e-004	0.0258	0.0000	79.4804	79.4804	1.9900e-003	0.0000	79.5301
Total	**0.0493**	**0.3789**	**0.3659**	**1.7500e-003**	**0.1163**	**2.5700e-003**	**0.1189**	**0.0314**	**2.4400e-003**	**0.0338**	**0.0000**	**162.4798**	**162.4798**	**8.6200e-003**	**0.0000**	**162.6954**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0456	0.4125	0.3622	5.8000e-004		0.0240	0.0240		0.0226	0.0226	0.0000	49.7961	49.7961	0.0122	0.0000	50.0998
Total	**0.0456**	**0.4125**	**0.3622**	**5.8000e-004**		**0.0240**	**0.0240**		**0.0226**	**0.0226**	**0.0000**	**49.7961**	**49.7961**	**0.0122**	**0.0000**	**50.0998**

3.4 Building Construction - 2020

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	9.5900e-003	0.3511	0.0687	8.7000e-004	0.0213	1.9900e-003	0.0233	6.1500e-003	1.9000e-003	8.0500e-003	0.0000	82.9994	82.9994	6.6300e-003	0.0000	83.1653
Worker	0.0397	0.0278	0.2972	8.8000e-004	0.0950	5.8000e-004	0.0956	0.0252	5.4000e-004	0.0258	0.0000	79.4804	79.4804	1.9900e-003	0.0000	79.5301
Total	**0.0493**	**0.3789**	**0.3659**	**1.7500e-003**	**0.1163**	**2.5700e-003**	**0.1189**	**0.0314**	**2.4400e-003**	**0.0338**	**0.0000**	**162.4798**	**162.4798**	**8.6200e-003**	**0.0000**	**162.6954**

3.4 Building Construction - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1853	1.6996	1.6161	2.6200e-003		0.0935	0.0935		0.0879	0.0879	0.0000	225.8463	225.8463	0.0545	0.0000	227.2085
Total	**0.1853**	**1.6996**	**1.6161**	**2.6200e-003**		**0.0935**	**0.0935**		**0.0879**	**0.0879**	**0.0000**	**225.8463**	**225.8463**	**0.0545**	**0.0000**	**227.2085**

3.4 Building Construction - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0365	1.4273	0.2746	3.9000e-003	0.0967	2.7300e-003	0.0994	0.0279	2.6100e-003	0.0305	0.0000	373.4620	373.4620	0.0285	0.0000	374.1742
Worker	0.1680	0.1132	1.2339	3.8500e-003	0.4308	2.5800e-003	0.4334	0.1144	2.3800e-003	0.1168	0.0000	348.3833	348.3833	8.1200e-003	0.0000	348.5862
Total	**0.2046**	**1.5406**	**1.5085**	**7.7500e-003**	**0.5275**	**5.3100e-003**	**0.5328**	**0.1423**	**4.9900e-003**	**0.1473**	**0.0000**	**721.8453**	**721.8453**	**0.0366**	**0.0000**	**722.7604**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.1853	1.6996	1.6161	2.6200e-003		0.0935	0.0935		0.0879	0.0879	0.0000	225.8461	225.8461	0.0545	0.0000	227.2082
Total	**0.1853**	**1.6996**	**1.6161**	**2.6200e-003**		**0.0935**	**0.0935**		**0.0879**	**0.0879**	**0.0000**	**225.8461**	**225.8461**	**0.0545**	**0.0000**	**227.2082**

3.4 Building Construction - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0365	1.4273	0.2746	3.9000e-003	0.0967	2.7300e-003	0.0994	0.0279	2.6100e-003	0.0305	0.0000	373.4620	373.4620	0.0285	0.0000	374.1742
Worker	0.1680	0.1132	1.2339	3.8500e-003	0.4308	2.5800e-003	0.4334	0.1144	2.3800e-003	0.1168	0.0000	348.3833	348.3833	8.1200e-003	0.0000	348.5862
Total	**0.2046**	**1.5406**	**1.5085**	**7.7500e-003**	**0.5275**	**5.3100e-003**	**0.5328**	**0.1423**	**4.9900e-003**	**0.1473**	**0.0000**	**721.8453**	**721.8453**	**0.0366**	**0.0000**	**722.7604**

3.5 Paving - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0126**	**0.1292**	**0.1465**	**2.3000e-004**		**6.7800e-003**	**6.7800e-003**		**6.2400e-003**	**6.2400e-003**	**0.0000**	**20.0235**	**20.0235**	**6.4800e-003**	**0.0000**	**20.1854**

3.5 Paving - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.4000e-004	4.3000e-004	4.7200e-003	1.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3333	1.3333	3.0000e-005	0.0000	1.3341
Total	**6.4000e-004**	**4.3000e-004**	**4.7200e-003**	**1.0000e-005**	**1.6500e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.3333**	**1.3333**	**3.0000e-005**	**0.0000**	**1.3341**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0126	0.1292	0.1465	2.3000e-004		6.7800e-003	6.7800e-003		6.2400e-003	6.2400e-003	0.0000	20.0235	20.0235	6.4800e-003	0.0000	20.1854
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0126**	**0.1292**	**0.1465**	**2.3000e-004**		**6.7800e-003**	**6.7800e-003**		**6.2400e-003**	**6.2400e-003**	**0.0000**	**20.0235**	**20.0235**	**6.4800e-003**	**0.0000**	**20.1854**

3.5 Paving - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	6.4000e-004	4.3000e-004	4.7200e-003	1.0000e-005	1.6500e-003	1.0000e-005	1.6600e-003	4.4000e-004	1.0000e-005	4.5000e-004	0.0000	1.3333	1.3333	3.0000e-005	0.0000	1.3341
Total	**6.4000e-004**	**4.3000e-004**	**4.7200e-003**	**1.0000e-005**	**1.6500e-003**	**1.0000e-005**	**1.6600e-003**	**4.4000e-004**	**1.0000e-005**	**4.5000e-004**	**0.0000**	**1.3333**	**1.3333**	**3.0000e-005**	**0.0000**	**1.3341**

3.6 Architectural Coating - 2021

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	**2.1900e-003**	**0.0153**	**0.0182**	**3.0000e-005**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.8000e-004**	**0.0000**	**2.5576**

3.6 Architectural Coating - 2021

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4300e-003	2.3100e-003	0.0252	8.0000e-005	8.7900e-003	5.0000e-005	8.8500e-003	2.3300e-003	5.0000e-005	2.3800e-003	0.0000	7.1108	7.1108	1.7000e-004	0.0000	7.1149
Total	**3.4300e-003**	**2.3100e-003**	**0.0252**	**8.0000e-005**	**8.7900e-003**	**5.0000e-005**	**8.8500e-003**	**2.3300e-003**	**5.0000e-005**	**2.3800e-003**	**0.0000**	**7.1108**	**7.1108**	**1.7000e-004**	**0.0000**	**7.1149**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.1900e-003	0.0153	0.0182	3.0000e-005		9.4000e-004	9.4000e-004		9.4000e-004	9.4000e-004	0.0000	2.5533	2.5533	1.8000e-004	0.0000	2.5576
Total	**2.1900e-003**	**0.0153**	**0.0182**	**3.0000e-005**		**9.4000e-004**	**9.4000e-004**		**9.4000e-004**	**9.4000e-004**	**0.0000**	**2.5533**	**2.5533**	**1.8000e-004**	**0.0000**	**2.5576**

3.6 Architectural Coating - 2021

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	3.4300e-003	2.3100e-003	0.0252	8.0000e-005	8.7900e-003	5.0000e-005	8.8500e-003	2.3300e-003	5.0000e-005	2.3800e-003	0.0000	7.1108	7.1108	1.7000e-004	0.0000	7.1149
Total	**3.4300e-003**	**2.3100e-003**	**0.0252**	**8.0000e-005**	**8.7900e-003**	**5.0000e-005**	**8.8500e-003**	**2.3300e-003**	**5.0000e-005**	**2.3800e-003**	**0.0000**	**7.1108**	**7.1108**	**1.7000e-004**	**0.0000**	**7.1149**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Mitigated	0.0568	0.4804	0.6636	2.8600e-003	0.2119	2.0900e-003	0.2139	0.0568	1.9600e-003	0.0587	0.0000	264.8292	264.8292	0.0144	0.0000	265.1901
Unmitigated	0.0568	0.4804	0.6636	2.8600e-003	0.2119	2.0900e-003	0.2139	0.0568	1.9600e-003	0.0587	0.0000	264.8292	264.8292	0.0144	0.0000	265.1901

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
City Park	89.98	449.90	449.90	554,831	554,831
Total	89.98	449.90	449.90	554,831	554,831

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
City Park	16.60	8.40	6.90	33.00	48.00	19.00	66	28	6

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
City Park	0.542116	0.037578	0.185203	0.118503	0.016241	0.005141	0.017392	0.068695	0.001383	0.001183	0.004582	0.000945	0.001038

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
City Park	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
City Park	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	9.0400e-003	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.5000e-004	5.5000e-004	0.0000	0.0000	5.8000e-004
Unmitigated	9.0400e-003	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.5000e-004	5.5000e-004	0.0000	0.0000	5.8000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	9.0100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.5000e-004	5.5000e-004	0.0000	0.0000	5.8000e-004
Total	**9.0400e-003**	**0.0000**	**2.8000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**5.5000e-004**	**5.5000e-004**	**0.0000**	**0.0000**	**5.8000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	9.0100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	3.0000e-005	0.0000	2.8000e-004	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.5000e-004	5.5000e-004	0.0000	0.0000	5.8000e-004
Total	**9.0400e-003**	**0.0000**	**2.8000e-004**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**5.5000e-004**	**5.5000e-004**	**0.0000**	**0.0000**	**5.8000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

Apply Water Conservation Strategy

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	74.2316	3.0600e-003	6.3000e-004	74.4972
Unmitigated	92.7895	3.8300e-003	7.9000e-004	93.1215

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 26.2126	92.7895	3.8300e-003	7.9000e-004	93.1215
Total		**92.7895**	**3.8300e-003**	**7.9000e-004**	**93.1215**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
City Park	0 / 20.9701	74.2316	3.0600e-003	6.3000e-004	74.4972
Total		**74.2316**	**3.0600e-003**	**6.3000e-004**	**74.4972**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Institute Recycling and Composting Services

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.2877	0.0170	0.0000	0.7129
Unmitigated	0.3837	0.0227	0.0000	0.9505

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	1.89	0.3837	0.0227	0.0000	0.9505
Total		**0.3837**	**0.0227**	**0.0000**	**0.9505**

8.2 Waste by Land Use

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
City Park	1.4175	0.2877	0.0170	0.0000	0.7129
Total		**0.2877**	**0.0170**	**0.0000**	**0.7129**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

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Appendix B

Biological Resources Letter Report

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January 13, 2020 COP-04

Mr. Eduardo Sida, MPH
Community Service Department
City of Perris
135 N. D Street
Perris, CA 92570

Subject: Biological Resources Letter Report for the Enchanted Hills Park Project

Dear Mr. Sida:

This letter presents the results of a biological resources technical study completed by HELIX Environmental Planning, Inc. (HELIX) for the Enchanted Hills Park Project (project) located in the City of Perris (City), Riverside County, California. The City proposes to create a park, south of Metz Road, in the community of Enchanted Hills.

This letter report is intended to summarize the existing biological resources within the site and provide an analysis of the proposed impacts in accordance with the California Environmental Quality Act (CEQA) and applicable federal, state, and local policy, including consistency with the adopted Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP).

INTRODUCTION

Project Location

The approximately 22.7-acre study area is located west of the intersection of Interstate 215 and State Route 74 , in Perris, Riverside County, California (Figure 1, *Regional Location*). The study area is located within the U.S. Geological survey (USGS) 7.5-minute Steele Peak quadrangle map in Section 25, Township 4 South, Range 4 West (Figure 2, *USGS Topography*). Specifically, the study area is bound by Metz Road to the north, Watson Road to the south, residential homes that front Altura Drive to the east, and Carter Drive to the west (Figure 3, *Aerial Photograph*). The study area is surrounded by residential development on all sides, and beyond the housing undeveloped land occurs to the north and east.

The study area is located within the Mead Valley Area Plan of the MSHCP but is not within a criteria cell or group. The nearest criteria cell occurs approximately one mile to the north (Figure 4, *MSHCP Criteria Cells*). The area plan subunits each have specific planning species and biological considerations. These items do not apply to the subject study area as it is not within a subunit. The study area occurs on

Assessor's Parcel Numbers (APNs) 326-062-017, 326-071-001, -002, 326-072-002, -003, -004, -005, and 326-073-001; APN 326-072-001 is not a part of the study area.

Project Description

The Enchanted Hills area was recognized as a park-deficient community, and subsequently, the City was awarded funds through California Department of Housing and Community Development to assist in the acquisition of parcels to create a park. Currently, the City is in the process of applying for a Proposition 68 – Statewide Park Development and Community Revitalization Program grant to construct the park. Additionally, the project site is in what the City's General Plan designates as Planning Area 7, which notes that there is a need for active parkland and sports fields for use by residents in this area. Presently the site is zoned as R5 – Mobile Home Subdivision and has a General Plan land use designation of R 6,000 (Single-Family Residential 6,000, square foot lot), which allows for a park.

The proposed project consists of a neighborhood park. Currently the project site is largely undeveloped; however, there are several trails, a BMX course, signs of disturbance, and man-made features. Site topography is relatively flat with a slight downward slope from the north to the south. While many natural features of the site will be retained, park development would include the introduction of hardscape and impermeable surfaces as well as turfed and landscaped areas.

Through a series of community outreach efforts, the City prepared a conceptual plan for the project. The plan includes a combination of passive and active recreational features. The park will include a multi-use field, child play area, toddler play area, restrooms, picnic shelters, hardscape, parking lots, bridges, trails, a basketball court, BMX course improvements, art rocks, a splash pad, a skating area, and a zip line. Additionally, the project would retain and incorporate some of the existing site features, such as Owl Rock, which is a painted boulder, and an existing BMX course that has been built by neighbors. The conceptual plan also identifies a detention basin near the Weston Road project entrance. There are three entrances to the site; one at the intersection of Weston Road and Diana Street, and two entrances that form a horse-shoe drive adjacent to and accessible from Metz Road. One parcel within the larger project area is not included as a part of the project as the City has been unable to acquire it (APN 326-072-001).

METHODS

Pre-Survey Investigation

The study area for this report is based on the proposed park site. The areas outside of the empty lot consists mostly of private property. Where feasible these areas were examined using binoculars. Prior to conducting field surveys, a thorough review of relevant maps, databases, and literature pertaining to biological resources known to occur within the project vicinity was performed. Recent and historical aerial imagery (Google 2019), topographic maps (USGS Steele Peak Quadrangle), soils maps (Natural Resource Conservation Service [NRCS] 2019), and other maps of the study area and vicinity were acquired and reviewed to obtain updated information on the natural environmental setting.

In addition, a query of sensitive species and habitats databases was conducted, including the U.S. Fish and Wildlife Service (USFWS) Critical Habitat Portal (2019a), USFWS species records (USFWS 2019b), California Department of Fish and Wildlife (CDFW) California Natural Diversity Database (CNDDB; CDFW

2019), and California Native Plant Society (CNPS) Electronic Inventory (California Native Plant Society [CNPS] 2019). The USFWS' National Wetlands Inventory (NWI) was also reviewed (USFWS 2019c). Recorded locations of species, habitat types, wetlands, and other resources were mapped and overlaid onto aerial imagery using Geographic Information Systems (GIS). The MSHCP was also thoroughly reviewed for context and to identify regional conservation goals and objectives for the vicinity of the project site that might conflict with the project.

General Biological Survey

HELIX biologist Laura Moreton performed a general biological survey on November 15, 2019, which included 100 percent visual coverage of the study area and immediate vicinity. The general biological survey included a general inventory of existing conditions and focused primarily on mapping existing vegetation communities or habitat types, mapping potential jurisdictional waters and wetlands, assessing suitability for sensitive plant and animal species, and noting other sensitive biological resources that occur or have the potential to occur. Meandering pedestrian transects were conducted throughout the site in order to obtain 100 percent visual coverage. Physical parameters assessed included vegetation and soil conditions, presence of indicator plant and animal species, slope, aspect, and hydrology.

Vegetation was mapped on 1"=100' scale aerial imagery. Vegetation community classifications follow Holland (1986) with additional classification assistance from the online Manual of California Vegetation (CNPS 2019). Plant species observed or otherwise detected during biological surveys of the study area are included in Attachment A. Animal species observed or detected are included in Attachment B. Sensitive species recorded within three miles of the site were analyzed for potential to occur (Attachment C; status codes in Attachment D). A complete list was compiled and recorded, and locations were mapped and overlaid onto aerial imagery using GIS. Plant identifications were made in the field. Directed inspections of habitat were performed to locate target rare plant species known to occur on the site and/or in the region. Animal species were identified by direct observation, vocalizations, or the observance of scat, tracks, or other signs. Representative photographs of the site were taken and are included in Attachment E.

Burrowing Owl Habitat Assessment

Ms. Moreton conducted a burrowing owl (*Athene cunicularia*) habitat assessment in accordance with the required protocol, on November 15, 2019 (County 2006). The habitat assessment covered the entire property. Burrows with a diameter of at least three inches and with potential to support burrowing owls were mapped (Figure 7, *Vegetation and Sensitive Species*). In addition, a 500-foot buffer zone was surveyed on foot, where accessible, with private property surveyed visually using binoculars from the edge of the subject property, where owl habitat directly bordered the property.

Survey Limitations

The lists of species identified are not necessarily comprehensive accounts of all species that occur on the site, as species that are nocturnal, secretive, or seasonally restricted may not have been observed.

Nomenclature

Nomenclature used in this report follows The Jepson Manual for plants (Baldwin et al. 2012), Taggart (2012) for reptiles, American Ornithological Society (2019) for birds, and Bradley et al. (2014) for mammals.

RESULTS

Existing Conditions

General Land Use

General land uses within the study area include vacant land, residential housing, and roads. The proposed location of the park is on vacant land. The site is bounded by Metz Road to the north, Watson Road to the south, residential homes that front Altura Drive to the east, and residences along Carter Drive to the west. Beyond the residential housing there is vacant land to the north and east of the project site. The Motte/Rimrock Reserve, which is classified as Public/Quasi-public (PQP) Conserved land owned by the University of California, is located approximately 200 feet north of the project site.

Disturbance

The study area is extremely disturbed. There are several trails and dirt paths that run though the site, some of which are wide enough to be used by cars, and tire tracks indicate that they are in fact used by vehicles. Multiple individuals were observed walking through the site and one of these people was walking dogs, off the leash. In addition, BMX bike jumps have been built in the western portion of the site. The site is frequently used for dumping, and numerous large items, such as mattresses, were observed throughout the site. Other trash items included food wrappers, toys, clothes, tires, oil containers, and furniture, among many other things. Vegetation is generally dominated by non-native and/or invasive plants throughout the site.

Topography and Soils

Elevations within the study area range from approximately 1,690 feet (515 meters) above mean sea level (AMSL) to 1,730 feet (527 meters) AMSL. The site is generally flat with undulating topography, and several rock outcrops are located throughout the study area. Two soil types, as mapped by NRCS (2019), occur within the survey area (Figure 6, *Soils*): Cieneba rocky sandy loam, 8 to 15 percent slopes, eroded and Hanford coarse sandy loam, 2 to 8 percent slopes.

Vegetation Communities/Habitat Types

Vegetation communities or land uses are classified in this report according to Holland (1986). Six vegetation communities or land use types were mapped within the study area: mule fat scrub, flat-topped buckwheat (disturbed), non-native grassland, tamarisk scrub, disturbed, and developed (Figure 7; Table 1, *Vegetation Communities and Land Uses*). A brief description of each community is provided below.

Table 1
VEGETATION COMMUNITIES AND LAND USES

Vegetation Community	Existing Acreage*
Upland	
Flat-topped buckwheat (disturbed)	1.7
Non-native grassland	2.8
Disturbed	16.0
Developed	<0.1
Subtotal	20.6
Wetland/Riparian	
Mule fat scrub	1.44
Tamarisk scrub	0.67
Subtotal	2.11
TOTAL	**22.71**

*Upland habitats are rounded to the nearest 0.1 acre and wetland/riparian habitats are rounded to the nearest 0.01 acre. Total reflects rounding.

Flat-topped Buckwheat (disturbed)

Flat-topped buckwheat (*Eriogonum fasiculatum*) is a monocultural community usually occurring due to disturbance and transitioning to coastal sage scrub or chaparral. It is often found in disturbed areas, as is the case at this site. One additional characteristic species is deerweed (*Acmispon glaber*). The study area supports 1.7 acres of this vegetation community, which occurs predominately within the northern portion of the site (Figure 7). This habitat type is entirely disturbed on the site. The only areas where it is present are surrounding and adjacent to large boulders and rocks where vehicular access is difficult, and/or limited, allowing this vegetation to remain. Species present include flat-topped buckwheat interspersed with non-native grasses and forbs, making it the disturbed form of the habitat type.

Non-native Grassland

Non-native grassland is composed of a dense to sparse cover of annual grasses and is often associated with numerous species of showy-flowered native annual forbs. This association occurs on gradual slopes with deep, fine-textured, usually clay soils. Characteristic species include oat (*Avena* spp.), red brome (*Bromus rubens*), ripgut grass (*B. diandrus*), ryegrass (*Lolium* sp.), and mustard (*Brassica* sp.). Most of the annual introduced species, that comprise the majority of species and biomass within non-native grassland, originated from the Mediterranean region, an area with a long history of agriculture and a climate similar to California. These two factors, in addition to intensive grazing and agricultural practices in conjunction with severe droughts, contributed to the successful invasion and establishment of these species and the replacement of native grasslands with annual dominated non-native grassland (Jackson 1985). The study area supports 2.8 acres of this vegetation community at the center of the site (Figure 7). Species present include oats, red brome, and ripgut grass.

Disturbed

Disturbed habitat includes unvegetated or sparsely vegetated areas, particularly where the soil has been heavily compacted by prior development or where agricultural lands have been abandoned. Disturbed habitat is generally dominated by non-native weedy species that adapt to frequent disturbance or consists of dirt trails and roads. The study area supports 16.0 acres of this vegetation community (Figure 7). A portion of the disturbed habitat has been used to build bike jumps for the community. There are also roads crossing most of the site, and countless dump sites and trash across the site. Disturbed habitat dominates the site, and is either unvegetated or dominated by disturbance-tolerant non-native species including short-pod mustard (*Hirschfeldia incana*), wild lettuce (*Lactuca serriola*), Russian thistle (*Salsola tragus*), Mediterranean grass (*Schismus barbatus*), and red brome. Native species present included dove weed (*Croton setigerus*) and paniculate tarplant (*Deinandra paniculata*).

Developed

Developed land is where permanent structures and/or pavement have been placed, which prevents the growth of vegetation, or where landscaping is clearly tended and maintained. Developed land in the study area consists of a section of pavement in the southeast corner of the project site. The study area includes less than 0.1 acre of developed land.

Mule Fat Scrub

Mule fat scrub consists of a depauperate, tall, herbaceous riparian scrub strongly dominated by mule fat (*Baccharis salicifolia*). It is maintained by frequent flooding. Most stands succeed to cottonwood-or sycamore-dominated riparian forests or woodlands. It is also associated with willows (*Salix* spp.) and nettle (*Urtica holosericea*). It is usually present below 2,000 feet in elevation (Holland 1986). The study area supports 1.44 acres of this vegetation community in the southwest portion of the site (Figure 7). There appear to have been mature willows at the site at one time, which were killed by drought or fire, as indicated by the presence of large, dead tree trunks. Some of these are re-sprouting; however, they are small in stature and the area is generally dominated by mule fat with an understory of non-native grasses. Species present included mule fat, willows, and giant wild rye (*Elymus condensatus*).

Tamarisk Scrub

Tamarisk scrub is typically composed of shrubs and/or small trees of exotic tamarisk species but may also contain willows, salt bushes (*Atriplex* spp.), catclaw acacia (*Acacia greggii*), and salt grass (*Distichlis spicata)*. This habitat occurs along intermittent streams in areas where high evaporation rates increase the salinity level of the soil. Tamarisk is a phreatophyte, which is a plant that can obtain water from an underground water table. The study area supports 0.67 acre of this vegetation community. Tamarisk scrub occurs in the southeast corner of the project site (Figure 7). Species present include tamarisk and Mexican fan palm (*Washingtonia robusta*) with an understory of non-native grasses.

General Fauna

The study area is generally disturbed and does not provide extensive high-quality habitat for animal species, although many species commonly known to tolerate disturbance were observed, including coyotes (*Canis latrans*; scat) and California ground squirrels (*Otospermophilus beecheyi*). Other species observed or otherwise detected within the study area included common bird species such as house finch (*Haemorhous mexicanus*), American crow (*Corvus brachyrhynchos*), and mourning dove (*Zenaida macroura*). A full list of animal species observed within the study area is included in Attachment B.

Sensitive Biological Resources

Sensitive Natural Communities

Sensitive natural communities include land that supports unique vegetation communities or the habitats of rare or endangered species or subspecies of animals or plants as defined by Section 15380 of the CEQA Guidelines.

The study area supports the following sensitive natural communities: mule fat scrub, flat-topped buckwheat (disturbed), non-native grassland, and tamarisk scrub.

Special-Status Plant Species

Special-status plant species are those listed as federally threatened or endangered by the USFWS; State listed as threatened or endangered or considered sensitive by the CDFW; and/or are CNPS California Rare Plant Rank (CRPR) List 1A, 1B, or 2 species, as recognized in the CNPS' Inventory of Rare and Endangered Vascular Plants of California and consistent with the CEQA Guidelines. Special-status plant species also include those identified in the MSHCP. A complete list of special-status plants known to occur in the area or listed for this area by the MSHCP, along with their potential to occur within the study area, is included as Attachment C.

Six special-status plant species are known to occur within three miles of the project site, three of which are listed at the federal and/or state level. None of the federally or state listed species are expected to occur on the site. The project is not located within an MSHCP Narrow Endemic Plant Species Survey Area (NEPSSA).

Paniculate tarplant was the only sensitive species observed during the general biology survey conducted on November 15, 2019. Except for paniculate tarplant, no rare plant species have potential to occur within the project impact footprint due to the lack of appropriate habitat and/or soils (Attachment C). A brief description of paniculate tarplant, the only sensitive plant species observed within the study area, during the general biological survey is provided below.

Paniculate tarplant (*Deinandra paniculata*)
Listing: --/--; CRPR List 4.2
Distribution: San Diego, Orange, Riverside, Los Angeles, Santa Barbra, and San Luis Obispo counties below approximately 4,330 feet in elevation
Habitat: Valley grassland
Status within the study area: Approximately 2,000 individuals of paniculate tarplant were observed within the study area, with the large majority occurring within the southern portion of the project site, toward the center of the site within disturbed habitat and non-native grassland.

Special-Status Animal Species

Special-status animal species are those listed as threatened or endangered, proposed for listing, or candidates for listing by the USFWS and considered sensitive animals by the CDFW. Special-status animal species also include those identified in the MSHCP. Special-status animal species with potential to occur in the study area are included in Attachment C.

Fourteen listed or sensitive animal species are known to occur within three miles of the project site, 14 of which are listed at the federal and/or state level. Three listed species are not expected to occur within the study area: western pond turtle (*Clemmys marmorata pallida*), southern grasshopper mouse (*Onychomys torridus ramona*), and coastal California gnatcatcher (*Polioptila californica californica*). Four listed species have low potential to occur within the study area: California glossy snake (*Arizona elegans occidentalis*), burrowing owl (*Athene cunicularia*), crotch bumblebee (*Bombus crotchii*), and western spadefoot (*Scaphiopus hammondii*). Six listed species have moderate potential to occur within the study area: southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*), orange-throated whiptail (*Cnemidophorus hyperthrus*), coastal western whiptail (*Cnemidophorus tigris stenjnegeri*), red-diamond rattlesnake (*Crotalus ruber*), Stephen's kangaroo rat (*Dipodomys stephensi*), and coast horned lizard (*Phrynosoma coronatum blainvillei*).

Prior to construction, protocol burrowing owl surveys will be completed to determine whether the site is occupied by the burrowing owl, although no owls or signs were observed during the habitat assessment. The on-site population of ground squirrels was small, with only five potential burrows observed within the study area. Most of the burrows were observed in rocky areas with limited lines of sight that would discourage burrowing owls, and most of the open areas of the site are either subject to human disturbance and trash, or thick non-native grasses, both of which would discourage burrowing owl usage. Based on the size and quality of the site and the known home ranges of burrowing owls, a minimum of 280 acres, it is estimated that the project site by itself could sustain less than one pair of burrowing owls (CDFW 2012).

There was one special-status animal species observed within the study area: Cooper's hawk (*Accipiter cooperii*), a CDFW Watch List species; Figure 7). A brief description of the sensitive animal species observed during the general biological survey is provided below. An explanation of status codes can be found in Attachment D.

Cooper's hawk (*Accipiter cooperii*)
Status: --/WL
Distribution: The Cooper's hawk is widely distributed throughout the MSHCP Plan Area within suitable habitat. It occurs within all Bioregions of the Plan Area.
Habitat(s): Oak groves, mature riparian woodlands, and eucalyptus stands or other mature forests.
Status within the study area: Observed enjoying a meal in a tree on the north side of the project site.

Nesting Birds and Raptors

The study area contains suitable nesting habitat (e.g., trees, shrubs) for several common bird species, including raptors, protected under the Migratory Bird Treaty Act (MBTA) and CFG Code.

Jurisdictional Waters and Wetlands

In the context of this assessment, jurisdictional waters and wetlands include waters of the U.S. regulated by the USACE pursuant to CWA Section 404; waters of the State regulated by the RWQCB pursuant to Section 401 of the CWA and State Porter-Cologne Water Quality Control Act; and/or streambed and riparian habitat regulated by the CDFW pursuant to Sections 1600 *et seq.* of CFG Code.

For the purpose of this report any habitat type generally associated with wetlands has been mapped as a potentially jurisdictional area (Figure 8, *Potentially Jurisdictional Areas*; Table 2, *Potentially Jurisdictional Wetlands).* Wetlands, potentially under the jurisdiction of USACE, RWQCB, CDFW, and/or Riparian/Riverine Areas under the MSHCP, within the study area are associated with an unnamed drainage in the southeastern portion of the project site. No project activities are planned in these areas (Figure 9, *Impacts*).

Table 2
POTENTIALLY JURISDICTIONAL WETLANDS

Jurisdictional Resource	Existing (acres) †
Mule fat scrub	1.44
Tamarisk scrub	0.67
TOTAL	**2.11**
†Acreage rounded to the nearest hundredth.	

Wildlife Corridors and Linkages

Important corridors and linkages have been identified on a local and regional scale throughout the MSHCP planning area. The study area is isolated, surrounded by residential development and surface streets, and is not located within a designated core or linkage. Therefore, it does not currently provide a wildlife corridor or linkage to the surrounding area. Secondly, as the proposed development is a park, it will continue to provide open space for urban wildlife, of similar quality as is provided in its current state. In summary, although the site does not provide a corridor or linkage, it will continue to provide an island of marginal habitat as a park.

APPLICABLE REGULATIONS

Based on the findings of this report, activities affecting the biological resources determined to exist or having the potential to exist within the study area could be subject to the federal, state, and local regulations discussed below.

Federal

Federal Endangered Species Act

Administered by the USFWS, the federal Endangered Species Act (ESA) provides the legal framework for the listing and protection of species that are identified as being endangered or threatened with extinction. Actions that jeopardize such species and their habitats are considered a “take” under the federal ESA.

Sections 7 and 10(a) of the federal ESA regulate actions that could harm or harass endangered or threatened species. Section 10(a) allows issuance of permits for “incidental” take of endangered or threatened species. The term “incidental” applies if the taking of the listed species is secondary to, and not the purpose of, an otherwise lawful activity. A conservation plan demonstrating how the take would be minimized and what steps taken would ensure the listed species’ survival must be submitted for the issuance of Section 10(a) permits. Section 7 describes a process of federal interagency consultation for use when federal actions may adversely affect listed species. A biological assessment is required for any major activity if it may affect listed species. The MSHCP was prepared pursuant to Section 10(a) of the ESA and the Permittees were issued an umbrella Section 10(a) Incidental Take Permit (ITP) from the USFWS authorizing take of multiple federally listed species.

Migratory Bird Treaty Act

All migratory bird species that are native to the United States or its territories are protected under the federal MBTA as amended under the Migratory Bird Treaty Reform Act of 2004 (FR Doc. 05-5127). The MBTA is generally protective of migratory birds but does not actually stipulate the type of protection required. In common practice, USFWS places restrictions on disturbances allowed near active raptor nests.

Clean Water Act

Federal wetland regulation (non-marine issues) is guided by the Rivers and Harbors Act of 1899 and the CWA. The Rivers and Harbors Act deals primarily with discharges into navigable waters, while the purpose of the CWA is to restore and maintain the chemical, physical, and biological integrity of all waters of the U.S. Permitting for projects filling waters of the U.S. (including wetlands and vernal pools) is overseen by the USACE under Section 404 of the CWA. Projects may be permitted on an individual basis or may be covered under one of several approved Nationwide Permits. Individual Permits are assessed individually based on the type of action, amount of fill, etc. A CWA Section 401 Water Quality Certification, which is administered by the RWQCB, must be issued prior to any 404 permit. Impacts to waters of the U.S. would result in a need for both a USACE 404 permit and a RWQCB 401 certification.

State

California Endangered Species Act

The California Endangered Species Act (CESA) declares that deserving plant or animal species will be given protection by the state because they are of ecological, educational, historical, recreational, aesthetic, economic, and scientific value to the people of the state. The CESA establishes that it is state policy to conserve, protect, restore, and enhance endangered species and their habitats. Under state law, plant and animal species may be formally designated as rare, threatened, or endangered through official listing by the California Fish and Game Commission. Listed species are given greater attention during the land use planning process by local governments, public agencies, and landowners than are species that have not been listed.

The CESA allows the take of listed endangered, threatened, or candidate species pursuant to a federally-issued Incidental Take Statement (ITS) under Section 7 of the FESA or ITP under Section 10 of the FESA, if the CDFW certifies that the ITS or ITP is consistent with CESA (Fish and Game Code Section 2080.1(a)). Section 2081(b) and (c) of the CESA allows CDFW to issue an ITP for a state-listed threatened and endangered species only if specific criteria are met. These criteria can be found in Title 14 CCR, Sections 783.4(a) and (b). No Section 2081(b) permit may authorize the take of "fully protected" species and "specified birds." If a project is planned in an area where a fully protected species or specified bird occurs, an applicant must design the project to avoid all take; the CDFW cannot provide take authorization under CESA. On private property, endangered plants may also be protected by the Native Plant Protection Act (NPPA) of 1977. In addition, CEQA requires disclosure of any potential impacts on listed species and alternatives or mitigation that would reduce those impacts. The MSHCP was prepared pursuant to Section 2081 of the CESA and the Permittees were issued an umbrella Section 2081 ITP from the CDFW authorizing take of multiple state listed species.

California Fish and Game Code Section 1600

The CFG Code provides specific protection and listing for several types of biological resources. Section 1600 of CFG Code requires a Streambed Alteration Agreement (SAA) for any activity that would alter the flow, change, or use any material from the bed, channel, or bank of any perennial, intermittent, or ephemeral river, stream, and/or lake. Typical activities that require an SAA include excavation or fill placed within a channel, vegetation clearing, structures for diversion of water, installation of culverts and bridge supports, cofferdams for construction dewatering, and bank reinforcement. Notification is required prior to any such activities.

California Fish and Game Code Sections 3503, 3503.5, and 3800

These sections of the CFG Code prohibit the take or possession of birds, their nests, or eggs. Disturbance that causes nest abandonment and/or loss of reproductive effort (killing or abandonment of eggs or young) is considered a take. Such a take would also violate federal law protecting migratory birds. ITPs are required from the CDFW for projects that may result in the incidental take of species listed by the state as endangered, threatened, or candidate species. The wildlife agencies require that impacts to protected species be minimized to the extent possible and mitigated to a less-than-significant level.

California Natural Community Conservation Planning Act of 1991

The NCCP Act is designed to conserve habitat-based natural communities at the ecosystem scale while accommodating compatible land uses in coordination with CESA. The CDFW is the principal state agency implementing the NCCP Program. The Act established a process to allow for comprehensive, long-term, regional, multi-species, and habitat-based planning in a manner that satisfies the requirements of the state and federal ESAs (through a companion regional habitat conservation plan). The NCCP program has provided the framework for innovative efforts by the state, local governments, and private interests, to plan for the protection of regional biodiversity and the ecosystems upon which they depend. NCCPs seek to ensure the long-term conservation of multiple species, while allowing for compatible and appropriate economic activity to proceed. The MSHCP was prepared pursuant to the NCCP Act.

Porter-Cologne Water Quality Control Act

The State Water Resources Control Board (SWRCB) and the RWQCB regulate the discharge of waste to waters of the State via the 1969 Porter-Cologne Water Quality Control Act as described in the California Water Code. The California Water Code is the State's version of the federal CWA. Waste, according to the California Water Code, includes sewage and any and all other waste substances, liquid, solid, gaseous, or radioactive, associated with human habitation, or of human or animal origin, or from any producing, manufacturing, or processing operation, including waste placed within containers of whatever nature prior to, and for purposes of, disposal.

State waters that are not federal waters may be regulated under the Porter-Cologne Water Quality Control Act. A Report of Waste Discharge must be filed with the RWQCB for projects that result in discharge of waste into waters of the State. The RWQCB will issue Waste Discharge Requirements (WDRs) or a waiver. The WDRs are the Porter-Cologne Water Quality Control Act version of a CWA Section 401 Water Quality Certification.

Local

Multiple Species Habitat Conservation Plan

The MSHCP is a comprehensive multi-jurisdictional effort that includes Riverside County and multiple cities in western Riverside County, including the City. Rather than address sensitive species on an individual basis, the MSHCP focuses on the conservation of 146 species, proposing a reserve system of approximately 500,000 acres and a mechanism to fund and implement the reserve system (Dudek and Associates 2003). Most importantly, the MSHCP allows participating entities to issue take permits for listed species so that individual applicants need not seek their own permits from the USFWS and/or CDFW. The MSHCP was adopted on June 17, 2003, by the Riverside County Board of Supervisors. The ITP was issued by both the USFWS and CDFW on June 22, 2004.

SIGNIFICANCE OF PROJECT IMPACTS AND PROPOSED MITIGATION

This section provides a project-level biological resources impact analysis for the proposed project in support of environmental review. The issues addressed in this section are derived from Appendix G of the CEQA Guidelines. Mitigation, monitoring, and reporting requirements to eliminate or reduce project impacts to a less-than-significant level are also provided in this section. Figure 9 depicts the project impacts to vegetation communities and sensitive resources.

ISSUE 1: Special-Status Species

Would the project have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?

Issue 1 Impact Analysis

<u>Less than Significant with Mitigation</u>. Paniculate tarplant, a CRPR List 4.2 species, is the only special status plant species observed within the project impact area or determined to have a high potential to occur. The study area supports approximately 2,000 individuals of paniculate tarplant, of which 1,750 (approximately 88 percent) would be impacted by project construction. The 1,750 paniculate tarplant to be impacted are isolated from surrounding populations, and therefore offer no long-term conservation value. Additionally, this species is locally abundant within the County of Riverside, including a population north of the project area within the PQP, which will be preserved (Calflora 2019). The proposed paniculate tarplant impacts cannot be avoided because the tarplant occurs across much of the site and total avoidance of paniculate tarplant in addition to the on-site riparian area would mean the project could not be completed. Paniculate tarplant is locally abundant in Riverside County; therefore, the impacts are not considered a threat to the continued existence of the species and are considered less

than significant. Therefore, no mitigation is proposed for impacts to paniculate tarplant from the proposed project.

One special status wildlife species, Cooper's hawk, was observed in the project impact area and could use the impact area. Cooper's hawk is a covered species under the MSHCP. Additional species listed in Attachment C have low or moderate potential to occur within the study area. However, the project has been designed to impact non-sensitive habitats, while preserving higher quality habitat. The PQP land 200 feet north of the study area provide ample higher quality habitat for the special status wildlife species with potential to use the impact area. Therefore, the project would not have a substantial adverse effect on special status species.

If certain avoidance measures were not incorporated during construction, the project could have an adverse effect on nesting birds protected by the MBTA and CFG Code, as discussed below.

Nesting Birds

The study area contains some trees, shrubs, and other vegetation that provide potential nesting habitat for common birds, including birds and raptors protected under the MBTA and CFG Code. Construction of the proposed project could occur during the general bird nesting season (January 15 through September 15) and, therefore, could result in impacts to nesting birds and violation of the MBTA and CFG Code. Direct impacts could occur as a result of removal of vegetation or soil supporting an active nest. Indirect impacts could occur as a result of construction noise impacting nearby trees or rocky beach areas, if they supported an active nest. Impacts would be considered significant if construction occurred within 300 feet of an active passerine nest or within 500 feet of an active raptor nest. Implementation of mitigation measure BIO-1 below would reduce potentially significant impacts on nesting birds and raptors to less-than-significant levels. In addition, the study area supports potential burrowing owl habitat, and therefore a pre-construction survey is required in order to avoid impacts on burrowing owls, as detailed in mitigation measure BIO-2 below.

Issue 1 Mitigation Measures

BIO-1 **Nesting Bird and Raptor Avoidance.** If initial grading and vegetation removal activities (i.e., earthwork, clearing, and grubbing) must occur during the general bird breeding season for migratory birds and raptors (January 15 through September 15), the project applicant shall retain a qualified biologist to perform a pre-construction survey of potential nesting habitat to confirm the absence of active nests belonging to migratory birds and raptors afforded protection under the MBTA and CFG Code. The pre-construction survey shall be performed no more than seven days prior to the commencement of the activities. If the qualified biologist determines that no active migratory bird or raptor nests occur within 300 feet of the impact site (500 feet for raptors), the activities shall be allowed to proceed without any further requirements. If the qualified biologist determines that an active migratory bird or raptor nest is present, no impacts shall occur within the 300 to 500 foot avoidance buffer which will be established based on the species observed to be nesting, until the young have fledged the nest and the nest is confirmed to no longer be active, or until noise barriers have been installed that adequately protect the nest, as determined by the qualified biologist.

BIO-2 **Burrowing Owl Pre-construction Survey.** A pre-construction burrowing owl survey shall be conducted. The burrowing owl pre-construction survey shall be conducted in accordance with the protocol described in the Burrowing Owl Survey Instruction for the Western Riverside Multiple Species Habitat Conservation Plan Area (County 2006). The initial take avoidance survey shall occur within 30 days prior to initiating ground disturbing activities. The project shall avoid disturbing active burrowing owl burrows (active nests), and a buffer shall be established between construction activities and occupied burrows, at the discretion of the biologist. If an adequate avoidance buffer cannot be provided between an occupied burrow and required ground-disturbing activities, then passive relocation activities during the non-breeding season (September 1 through February 29) may be authorized in consultation with CDFW, which would include preparation, approval, and implementation of a Burrowing Owl Exclusion Plan in accordance with protocol described in the CDFW Staff Report on Burrowing Owl Mitigation. No impacts shall occur to active burrowing owl nests.

ISSUE 2: Sensitive Natural Communities

Would the project have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS?

Issue 2 Impact Analysis

Less than Significant with Mitigation. Temporary and permanent impacts would occur within two sensitive habitats: flat-topped buckwheat (disturbed) and non-native grassland (Table 3, *Impacts to Vegetation Communities*; Figure 9). There would be no direct impacts to sensitive riparian habitat.

Table 3
IMPACTS TO VEGETATION COMMUNITIES

Vegetation Community	Existing Acreage[1]	Permanent Impact[2]
Upland		
Flat-topped buckwheat (disturbed)	1.7	0.7
Non-native grassland	2.8	1.8
Disturbed	16.1	7.0
Developed	<0.1	0.0
Subtotal	20.7	**9.5**
Wetland/Riparian		
Mule fat scrub	1.44	0.00
Tamarisk scrub	0.67	0.00
Subtotal	2.11	**0.00**
TOTAL	**22.81**	**9.5**

[1]Upland habitats are rounded to the nearest 0.1 acre and wetland/riparian habitats are rounded to the nearest 0.01 acre. Total reflects rounding.
[2]Additional temporary impacts to upland habitat may result due to grading, access, and staging during construction.

The temporary impact area consists of the temporary construction area, which would be used for construction access and stockpiling during construction. The permanent impact area consists of the park and associated infrastructure such as parking lots, restrooms, and play equipment. There would be no impacts to potential wetlands as the project has been designed to avoid these areas. The impact footprint shown on Figure 9 includes the minor grading and laydown areas required for construction; thus, there would be no additional impacts beyond the footprint shown. Impacts to flat-topped buckwheat (disturbed) and non-native grassland are covered by the MSHCP and no mitigation is required for those habitats because the project site is located outside of a Criteria Cell.

Potential significant indirect impacts could occur if storm water runoff is not controlled at the construction site, and sediment, toxics, and/or other material are inadvertently carried into sensitive habitat within the mule fat scrub or tamarisk scrub east of the impact area. Further, if the construction work areas are not properly fenced, inadvertent encroachment into adjacent sensitive riparian habitat could occur. Compliance with existing regulations for water quality, storm water management, and implementation of mitigation measure BIO-3 below would reduce potentially significant impacts on sensitive natural communities to less-than-significant levels.

Issue 2 Mitigation Measures

BIO-3 **Construction Fencing**. Temporary construction fencing (with silt barriers as needed according to the stormwater pollution prevention plan [SWPPP]) shall be installed at the limits of project impacts (including construction staging areas and access routes) adjacent to sensitive habitat to prevent sensitive habitat impacts and to prevent the spread of silt from the construction zone into adjacent habitats. Temporary fencing shall be located on the eastern boundary of the impact area west of the mule fat and tamarisk scrub (Figure 7). Fencing shall be installed in a manner that does not impact habitats to be avoided.

Construction crews shall strictly limit their activities, vehicles, equipment, and construction materials to the fenced project footprint. Equipment maintenance, staging, and dispensing of fuel, oil, coolant, or other such activities shall occur in designated areas within the fenced project impact limits. These designated areas shall be located in previously compacted and disturbed areas to the maximum extent practicable in such a manner as to prevent runoff from entering adjacent habitat and shall be shown on the construction plans. Contractor equipment shall be checked for leaks prior to operation and repair, as necessary. “No-fueling zones” shall be designated on construction plans.

If work occurs beyond the fenced or demarcated limits of impact, work shall cease until the problem has been remedied to the satisfaction of the City. Impacts that occur to sensitive riparian areas beyond the approved fence shall be mitigated as determined by the City in coordination with the USFWS, USACE, RWQCB, and/or CDFW. Temporary construction fencing shall be removed upon project completion.

ISSUE 3: Wetlands

Would the project have a substantial adverse effect on federally-protected wetlands as defined by Section 404 of the federal Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption or other means?

Issue 3 Impact Analysis

No significant Impact. The proposed project is designed to avoid all potentially jurisdictional wetlands within the study area.

Issue 3 Mitigation Measures

Implementation of mitigation measure BIO-3 would reduce potential indirect impacts to potential wetlands to less than significant.

ISSUE 4: Wildlife Movement and Nursery Sites

Would the project interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory corridors, or impede the use of native wildlife nursery sites?

Issue 4 Impact Analysis

Less than Significant. The project site encompasses undeveloped land within the Mead Valley Area Plan of the MSHCP. The project site is currently surrounded by residential development and roads. Though the project site may provide movement though the neighborhood for wildlife adapted to urban environments, this will not change with the planned development. The park will be built primarily on the west side of the site (Figure 5, *Conceptual Site Plan*). The east side of the site will remain in its current state. No known wildlife nursery sites occur on the project site.

Project construction would be restricted to daytime hours and would not be expected to result in adverse indirect impacts on off-site habitat adjacent to the site. Construction work limits would be contained within temporary construction fencing in accordance with mitigation measure BIO-3. Therefore, potential impacts on wildlife movement and nursery sites within the project area would be less than significant.

Issue 4 Mitigation Measures

Mitigation is not required.

ISSUE 5: Local Policies and Ordinances

Would the project conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Issue 5 Impact Analysis

No Impact. The project would not conflict with local policies or ordinances protecting biological resources, as further detailed below.

Consistency with City of Perris Municipal Code

There are no City ordinances that protect biological resources on the site.

Issue 5 Mitigation Measures

Mitigation is not required.

ISSUE 6: Adopted Conservation Plans

Would the project conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, or other approved local, regional, or state habitat conservation plan?

Issue 6 Impact Analysis

Less than Significant. The project occurs within the boundaries of the adopted MSHCP, within the Mead Valley Area Plan. The project would be consistent with the MSHCP, as detailed below.

MSHCP Consistency Analysis

The purpose of this section is to provide an analysis of the project with respect to consistency with biological resources aspects of the MSHCP.

The project was evaluated for consistency with the following MSHCP issue areas:

- MSHCP Reserve Assembly requirements;
- Section 6.1.2 (Protection of Species Associated with Riparian/Riverine Areas and Vernal Pools);
- Section 6.1.3 (Protection of Narrow Endemic Plant Species);
- Section 6.1.4 (Guidelines Pertaining to the Urban/Wildlands Interface);
- Section 6.3.2 (Additional Survey Needs and Procedures); and,
- Section 6.4 (Fuels Management).

The sections below provide a summary demonstrating how the project is consistent with MSHCP requirements for each of the above-listed issue areas.

Project Relationship to the Reserve Assembly

The study area is located in the Mead Valley Area Plan of the MSHCP, outside of a Criteria Cell (Figure 4). Based on the limited size and nature of the project, composition of the habitats proposed for impacts, location of the impacts adjacent to development, and location outside of a Criteria Cell, implementation of the project would not conflict with the conservation goals of the MSHCP. The project is consistent with MSHCP Reserve Assembly requirements.

Consistency with Multiple Species Habitat Conservation Plan Section 6.1.2

The project is consistent with the policies of Section 6.1.2 that protect species associated with Riparian/Riverine Areas and Vernal Pools. The project was redesigned to minimize impacts by locating the project footprint entirely outside of Riparian/Riverine Areas. No vernal pools, ephemeral ponds, or similar habitat exist within the study area and no associated species are expected to occur. The project would completely avoid direct impacts to Riparian Areas within the southeast corner of the project and implement mitigation measure BIO-3 to avoid indirect impacts to Riparian/Riverine Areas to the maximum extent possible.

No plant or animal species listed in Section 6.1.2 was observed within the study area. Therefore, impacts to Riparian/Riverine Species are less than significant.

Consistency with Multiple Species Habitat Conservation Plan Section 6.1.3

As discussed above, the project site is not within a NEPSSA, no NEPSSA plant species were observed during the general biological survey, and none are expected to occur within the project impact footprint; therefore, no impacts to NEPSSA species are proposed. The project is consistent with Section 6.1.3 of the MSHCP.

Consistency with Multiple Species Habitat Conservation Plan Section 6.1.4

The project area is located 200 feet south of PQP land. The Urban/Wildland Interface Guidelines (UWIG) of MSHCP Section 6.1.4 apply to projects that occur within or adjacent to the conservation area under the MSHCP. This project is separated from MSHCP conservation areas by a road and a residential development; therefore, the project is not adjacent to the PQP land and will be consistent with this requirement.

Consistency with Multiple Species Habitat Conservation Plan Policy Section 6.3.2

The project is not within CASSA; therefore, a focused rare plant survey was not conducted.

A burrowing owl habitat assessment was conducted consistent with MSHCP Section 6.3.2. There were no burrowing owls detected inside or within 100 feet of the impact area during the general biology survey; however, because burrows with potential to support burrowing owls were observed, a pre-construction burrowing owl survey will be conducted prior to project initiation. The habitat assessment determined that the site does not have the potential to support three pairs of burrowing owls, nor does it support 35 acres of suitable burrowing owl habitat; therefore, on-site conservation of burrowing owl habitat is not required according to MSHCP table 9-2, and a pre-construction survey and passive relocation outside of the breeding season would ensure consistency with the MSHCP. A pre-construction survey will be conducted per mitigation measure BIO-2.

Fuels Management (Multiple Species Habitat Conservation Plan Section 6.4)

There are no fuel management restrictions for this project because the project is not adjacent to MSHCP Conservation Area; therefore, Section 6.4 does not apply to this project.

Multiple Species Habitat Conservation Plan Development Fee

The project is not a residential or commercial development project and would not be subject to the associated per acre fee.

Stephens' Kangaroo Rat Fee

The project is not a residential or commercial development project and would not be subject to the associated per acre fee.

ISSUE 6 Mitigation Measures

Mitigation is not required for the project.

CLOSING

The proposed biological mitigation measures for the project are summarized in Table 4, *Summary of Biological Mitigation Measures*.

Table 4
SUMMARY OF BIOLOGICAL MITIGATION MEASURES

Impact	Proposed Mitigation	Level of Significance After Mitigation
Issue 1 Nesting Birds	**BIO-1 Nesting Bird and Raptor Avoidance.** If initial grading and vegetation removal activities (i.e., earthwork, clearing, and grubbing) must occur during the general bird breeding season for migratory birds and raptors (January 15 through September 15), the project applicant shall retain a qualified biologist to perform a pre-construction survey of potential nesting habitat to confirm the absence of active nests belonging to migratory birds and raptors afforded protection under the MBTA and CFG Code. The pre-construction survey shall be performed no more than seven days prior to the commencement of the activities. If the qualified biologist determines that no active migratory bird or raptor nests occur within 300 feet of the impact site (500 feet for raptors), the activities shall be allowed to proceed without any further requirements. If the qualified biologist determines that an active migratory bird or raptor nest is present, no impacts shall occur until the young have fledged the nest and the nest is confirmed to no longer be active, or until noise barriers have been installed that adequately protect the nest, as determined by the qualified biologist.	Less than significant
Issue 1 Burrowing Owls	**BIO-2 Burrowing Owl Pre-construction Survey.** A pre-construction burrowing owl survey shall be conducted. The burrowing owl pre-construction survey shall be conducted in accordance with the protocol described in the Burrowing Owl Survey Instruction for the Western Riverside Multiple Species Habitat Conservation Plan Area (County 2006). The initial take avoidance survey shall occur within 30 days prior to initiating ground disturbing activities. The project shall avoid disturbing active burrowing owl burrows (active nests), and a buffer shall be established between construction activities and occupied burrows, at the discretion of the biologist. If an adequate avoidance buffer cannot be provided between an occupied burrow and required ground-disturbing activities, then passive relocation activities during the non-breeding	Less than significant

Table 4
SUMMARY OF BIOLOGICAL MITIGATION MEASURES

Impact	Proposed Mitigation	Level of Significance After Mitigation
	season (September 1 through February 29) may be authorized in consultation with CDFW, which would include preparation, approval, and implementation of a Burrowing Owl Exclusion Plan in accordance with protocol described in the CDFW Staff Report on Burrowing Owl Mitigation. No impacts shall occur to active burrowing owl nests. .	
Issue 2 Riparian Habitat and Sensitive Natural Communities	**BIO-3 Construction Fencing**. Temporary construction fencing (with silt barriers as needed according to the stormwater pollution prevention plan [SWPPP]) shall be installed at the limits of project impacts (including construction staging areas and access routes) adjacent to sensitive habitat to prevent sensitive habitat impacts and to prevent the spread of silt from the construction zone into adjacent habitats. Temporary fencing shall be located on the eastern boundary of the impact area west of the mule fat and tamarisk scrub (Figure 7). Fencing shall be installed in a manner that does not impact habitats to be avoided.	Less than significant

We appreciate the opportunity to provide you with this letter report. Please do not hesitate to contact me or Karl Osmundson at (619) 462-1515 if you have any questions or require further assistance.

Sincerely,

Beth Ehsan

Beth Ehsan
Biology Project Manager

Attachments

Figure 1: Regional Location
Figure 2: USGS Topography
Figure 3: Aerial Photograph
Figure 4: MSHCP Criteria Cells
Figure 5: Conceptual Site Plan
Figure 6: Soils
Figure 7: Vegetation and Sensitive Species
Figure 8: Potentially Jurisdictional Areas
Figure 9: Impacts

Attachment A Plant Species Observed
Attachment B Animal Species Observed or Detected
Attachment C Special-Status Species with Potential to Occur
Attachment D Explanation of Status Codes for Plant and Animal Species
Attachment E Representative Site Photographs

REFERENCES

American Ornithological Society. 2019. Checklist of North and Middle American Birds (online checklist). Retrieved from: http://checklist.aou.org/taxa/.

Bradley, R.D., Ammerman, L.K., Baker, R.J., Bradley, L.C., Cook, J.A., Dowler, R.D. Jones, C., Schmidly, D.J, Stangi, F.B., Van De Bussche, R.A., Wursig, B. (2014). Revised checklist of North American mammals north of Mexico. Museum of Texas Tech University Occasional Papers. 327:1-27.

Baldwin, B.G., D.H. Goldman, D.J. Keil, R. Patterson, T.J. Rosatti, and D.H. Wilken, editors. 2012. The Jepson Manual: Vascular plants of California. 2nd edition. University of California Press, Berkeley.

Calflora. 2019. https://www.calflora.org/ Accessed December 20.

California Department of Fish and Wildlife (CDFW). 2019. California Natural Diversity Database (CNDDB). RareFind 5. Retrieved from: https://apps.wildlife.ca.gov/myaccount/login?ReturnUrl=%2frarefind%2fview%2fRareFind.aspx. California Department of Fish and Wildlife Data accessed November 20.

2012. Staff Report on Burrowing Owl Mitigation. March 7.

California Native Plant Society (CNPS). 2019. Inventory of rare and endangered plants. Rare Plant Program. Online edition, v8-02. Retrieved from: http://cnps.site.aplus.net/cgi-bin/inv/inventory.cgi. Updated quarterly. Accessed November 20.

Dudek and Associates. 2003. Western Riverside County multiple species habitat conservation plan (MSHCP). Final MSHCP, Volume I. Prepared for the County of Riverside Transportation and Land Management Agency. Approved June 17.

Google Earth. 2019. Google Earth 5.0. Available for download online at: https://www.google.com/earth/.

Holland R.F. 1986. Preliminary descriptions of the terrestrial natural communities of California. Nongame-Heritage Program: State of California, Department of Fish and Game, Sacramento. 156 pp.

Jackson, L. 1985. Ecological origins of California's Mediterranean grasses. Journal of Biogeography 12: 349-361.

Natural Resource Conservation Service (NRCS). 2019. National Resource Conservation Service web soil survey. Retrieved from: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx.

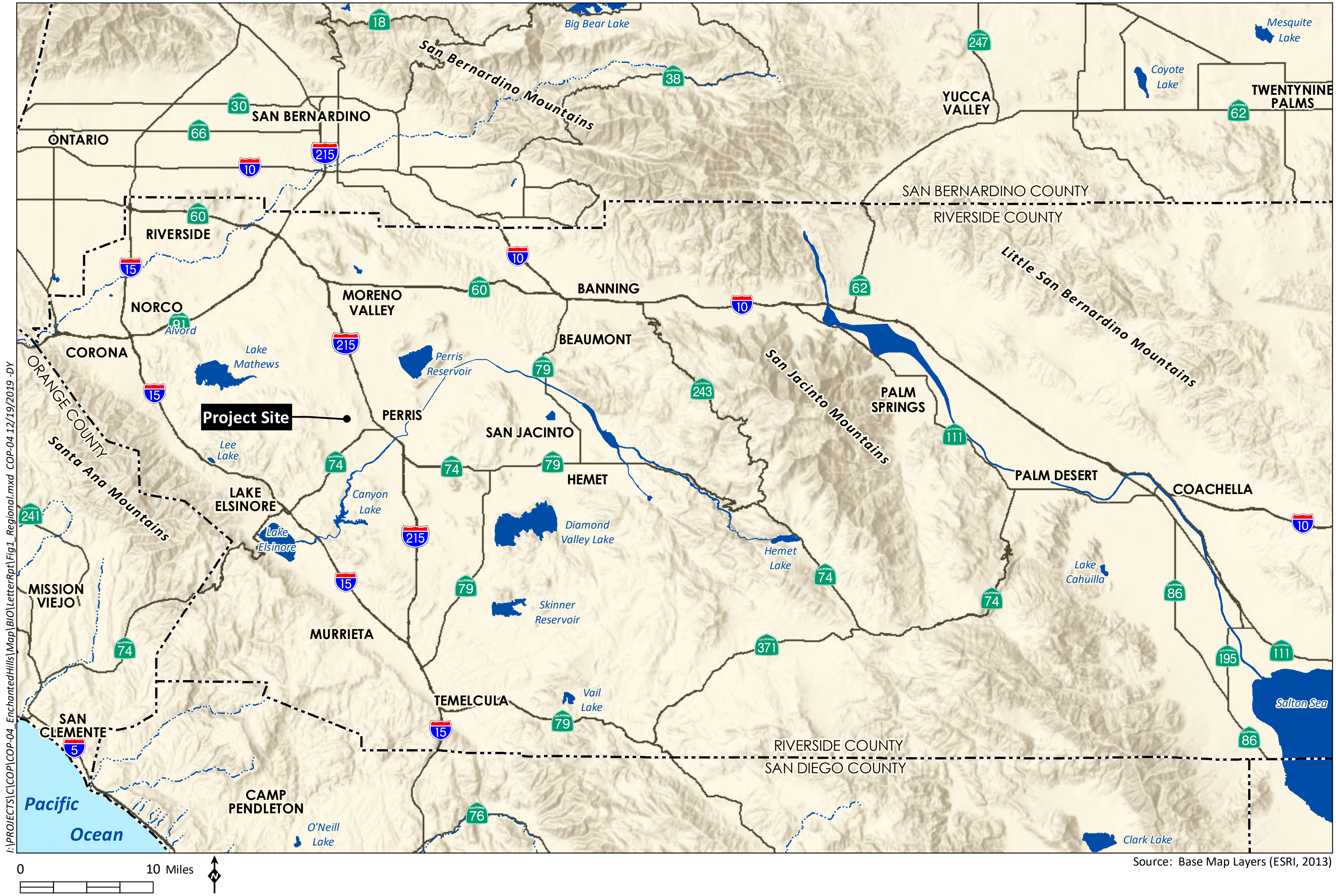
Riverside, County of. 2006. Burrowing Owl Survey Instructions for the Western Riverside Multiple Species Habitat Conservation Plan Area. Environmental Programs Department. Retrieved from: https://www.wrc-rca.org/archivecdn/Monitoring/Burrowing_Owl_Survey_Instructions.pdf. March 29.

Taggart, T.W. 2012. The Center for North American Herpetology (CNAH): The Academic Portal to North American Herpetology. Retrieved from: http://www.cnah.org/.

U.S. Fish and Wildlife Service (USFWS). 2019a. Critical Habitat Portal. Retrieved from: http://ecos.fws.gov/crithab.

2019b. IPaC Information for Planning and Conservation. Retrieved from: https://ecos.fws.gov/ipac/.

2019c. National Wetlands Inventory. Retrieved from: https://www.fws.gov/wetlands.



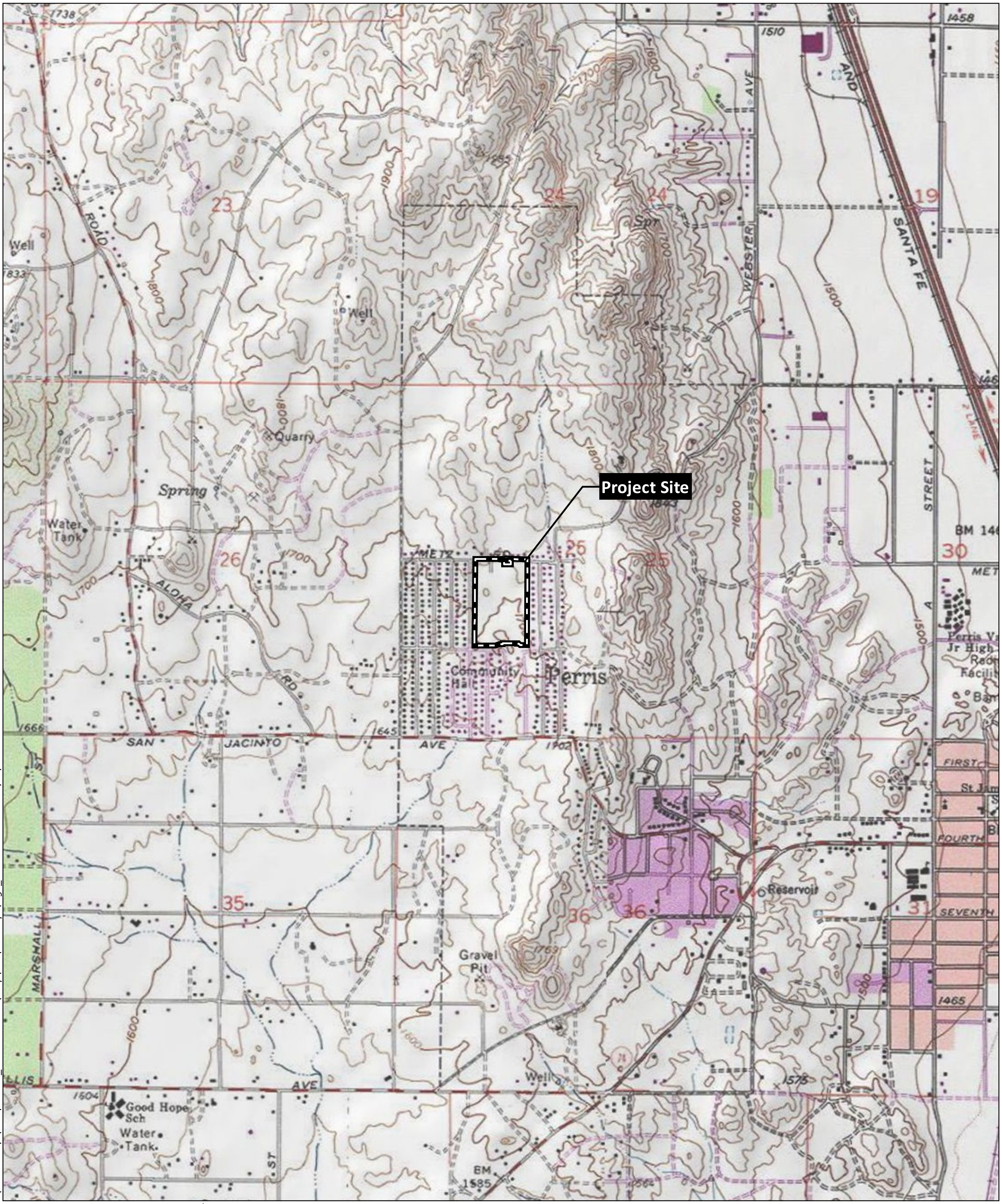
Source: Base Map Layers (ESRI, 2013)

0 10 Miles

HELIX Environmental Planning

Regional Location

Figure 1



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Source: Steele Park 7.5' Quad (USGS)

HELIX
Environmental Planning

USGS Topography

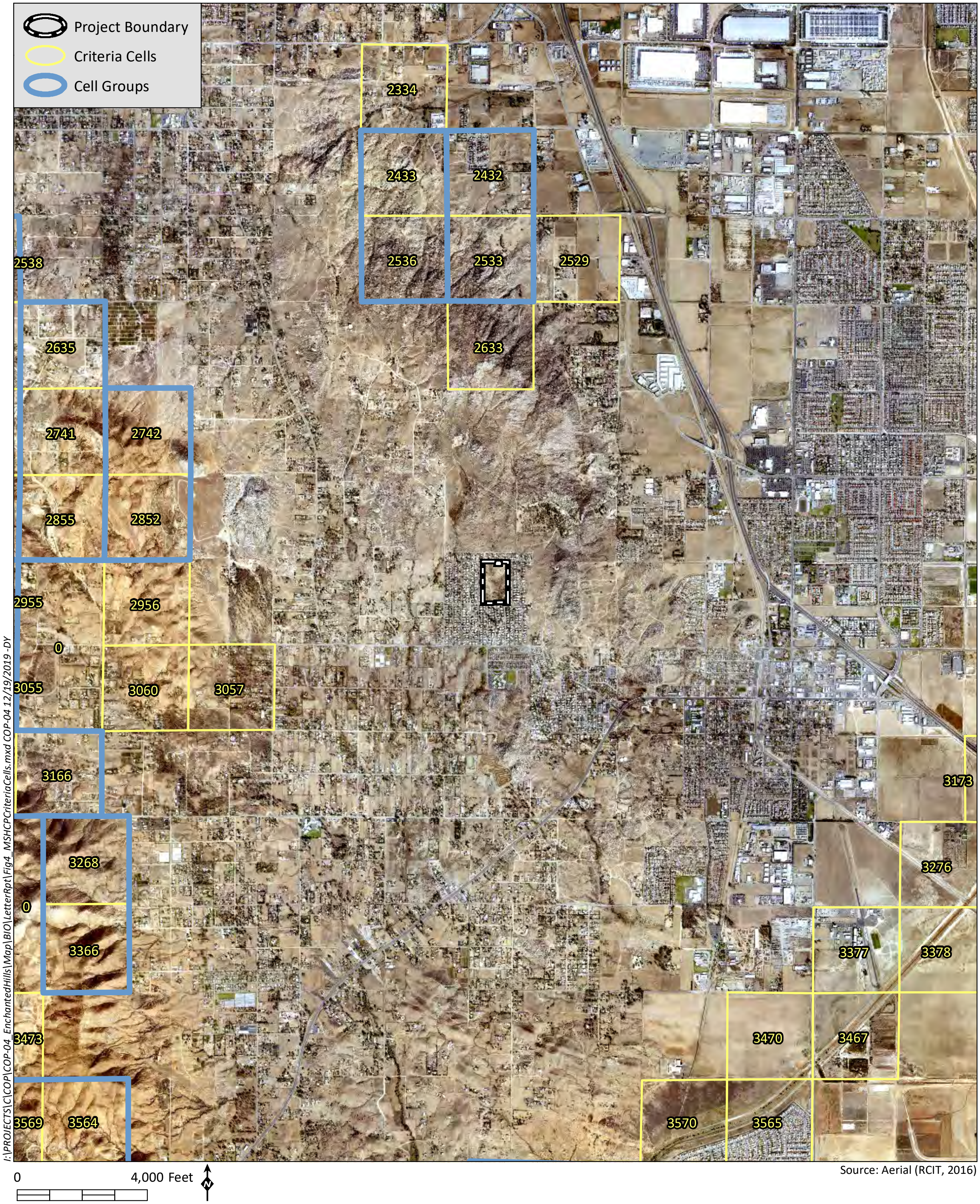
Figure 2

Source: Aerial (RCIT, 2016)

HELIX Environmental Planning

Aerial Photograph

Figure 3

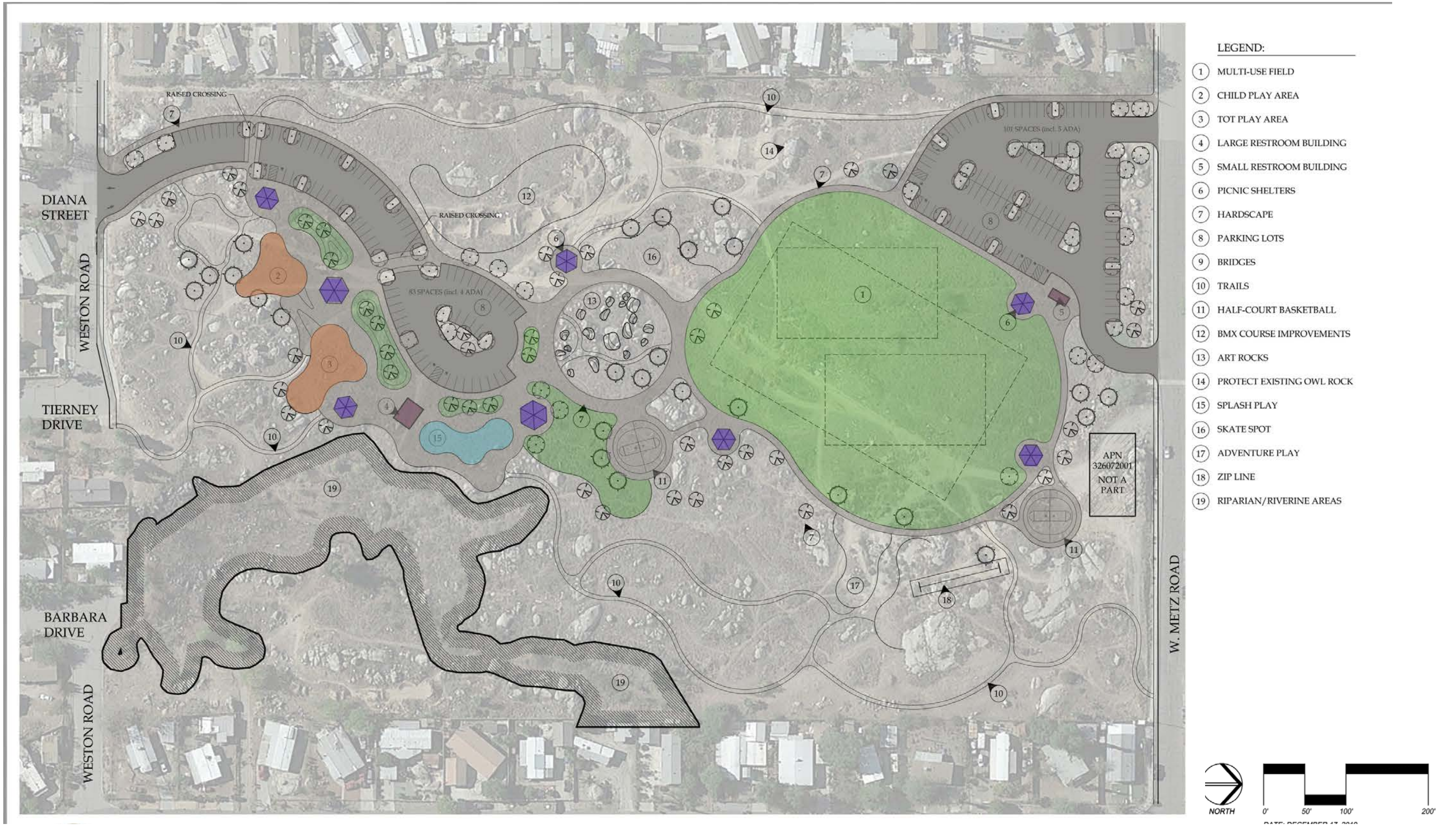


Source: Aerial (RCIT, 2016)

HELIX
Environmental Planning

MSHCP Criteria Cells

Figure 4



Source: City of Perris 2019

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HELIX
Environmental Planning

Conceptual Site Plan

Figure 5

Source: Aerial (RCIT, 2016)

HELIX Environmental Planning

Soils

Figure 6

Source: Aerial (RCIT, 2016)

HELIX
Environmental Planning

Vegetation and Sensitive Species

Figure 7

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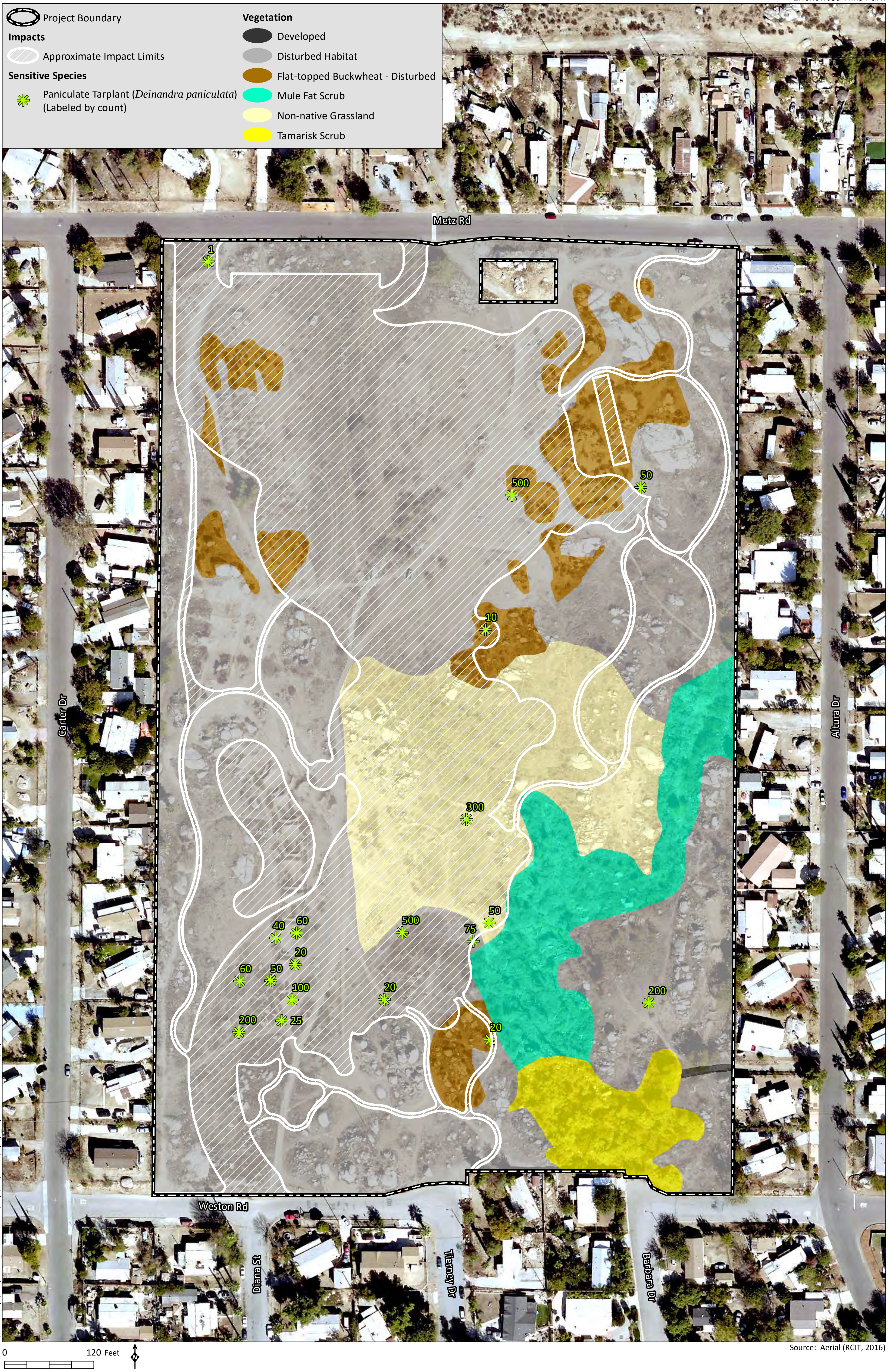
0 170 Feet

Source: Aerial (RCIT, 2016)

HELIX Environmental Planning

Potentially Jurisdictional Areas

Figure 8



Source: Aerial (RCIT, 2016)

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HELIX Environmental Planning

Impacts

Figure 9

Attachment A

PLANT SPECIES OBSERVED

Family	Scientific Name	Common Name
ANGIOSPERMS – EUDICOTS		
Adoxaceae	*Sambucus nigra* ssp. *caerulea*	blue elderberry
Aizoaceae	*Malephora crocea**	coppery mesembryanthemum
Anacardiaceae	*Schinus molle**	Peruvian pepper tree
Asteraceae	*Baccharis salicifolia*	mule fat
	Corethrogyne filaginifolia	common sandaster
	Deinandra paniculata	paniculate tarplant
	Encelia farinosa	brittlebush
	Ericameria palmeri	Palmer's goldenbush
	Erigeron canadensis	horseweed
	Helianthus annuus	western sunflower
	Heterotheca grandiflora	telegraph weed
	*Lactuca serriola**	wild lettuce
	*Oncosiphon piluliferum**	stinknet
Boraginaceae	*Amsinckia* sp.	fiddleneck
	Heliotropium curassavicum var. *occulatum*	salt heliotrope
Brassicaceae	*Hirschfeldia incana**	short-pod mustard
Cactaceae	*Cylindropuntia californica*	California cholla
	*Opuntia ficus-indica**	Mission cactus
Chenopodiaceae	*Atriplex semibaccata**	Australian saltbush
	*Amaranthus albus**	white tumbleweed
	Chenopodium sp.*	pigweed
	*Salsola tragus**	Russian thistle
Cucurbitaceae	*Cucurbita palmata*	coyote melon
Euphorbiaceae	*Croton setigerus*	dove weed
	*Ricinus communis**	castor bean
Fabaceae	*Acmispon glaber*	deerweed
	*Parkinsonia aculeata**	Mexican palo verde
	Prosopis glandulosa	honey mesquite
Lamiaceae	*Marrubium vulgare**	horehound
Malvaceae	*Malacothamnus fasciculatus*	chaparral bush mallow
Myrtaceae	*Eucalyptus sp.**	eucalyptus
Polygonaceae	*Eriogonum fasciculatum*	buckwheat
Salicaceae	*Populus fremontii* ssp. *fremontii*	Fremont cottonwood
	Salix gooddingii	Goodding's black willow
	Salix laevigata	red willow
Solanaceae	*Datura wrightii*	jimson weed
	*Nicotiana glauca**	tree tobacco
Tamaricaceae	*Tamarix ramosissima**	saltcedar
Urticaceae	*Urtica dioica*	stinging nettle

Attachment A (cont.)

Plant Species Observed (cont.)

Family	Scientific Name	Common Name
ANGIOSPERMS – MONOCOTS		
Arecaceae	*Washingtonia robusta**	Mexican fan palm
Agavaceae	*Agave americana**	century plant
Poaceae	*Avena* sp.*	oat
	*Bromus diandrus**	common ripgut brome
	Bromus madritensis ssp. *rubens**	foxtail chess
	Elymus condensatus	giant wild rye
	*Schismus barbatus**	Mediterranean grass

* Non-native species

Attachment B

ANIMAL SPECIES OBSERVED OR DETECTED

Order	Family	Scientific Name	Common Name
Invertebrates			
Hymenoptera	Formicidae		ant
Lepidoptera	Hesperiidae	*Pyrgus albescens*	white checkered-skipper
	Lycaenidae	*Brephidium exila*	western pygmy-blue
	Nymphalidae	*Vanessa cardui*	painted lady
Reptiles			
Squamata			lizard
Birds			
Accipitriformes	Accipitridae	*Accipiter cooperii*†	Cooper's hawk
		Buteo jamaicensis	red-tailed hawk
		Cathartes aura	turkey vulture
Apodiformes	Trochilidae		hummingbird
Columbiformes	Columbidae	*Zenaida macroura*	mourning dove
Falconiformes	Falconidae	*Falco sparverius*	American kestrel
Passeriformes	Corvidae	*Aphelocoma californica*	California scrub-jay
		Corvus brachyrhynchos	American crow
	Fringillidae	*Haemorhous mexicanus*	house finch
	Mimidae	*Mimus polyglottos*	northern mockingbird
	Passerellidae	*Melozone crissalis*	California towhee
		Zonotrichia leucophrys	white-crowned sparrow
Piciformes	Picidae	*Dryobates nuttallii*	Nuttall's woodpecker
Mammals			
Carnivora	Canidae	*Canis latrans*	coyote
Lagomorpha	Leporidae	*Sylvilagus audubonii*	desert cottontail
Perissodactyla	Equidae	*Equus ferus caballus*	horse
Rodentia	Sciuridae	*Otospermophilus beecheyi*	California ground squirrel

† Sensitive species

Attachment C

Table 1
POTENTIAL FOR LISTED OR SENSITIVE PLANTS TO OCCUR ON-SITE

Species	Sensitivity Status*	Habitat/Description	Status on Site
San Jacinto Valley crownscale (*Atriplex coronata* var. *notatior*)	FE/-- CRPR 1B.1	Herb. Occurs in playas, chenopod scrub, valley and foothill grassland, and vernal pools. Elevation range: 1,250 to 1,805 feet. Flowering period: April – August.	Not expected. Nearest observation is 1.6 miles southeast of the project site in 1965. No playas or vernal pools occur on site.
Thread-leaved brodiaea (*Brodiaea filifolia*)	FT/SE CRPR 1B.1	Herb. Found in semi alkaline mud flats and vernal pools, in clay soils. Elevation range: 82-2,821 feet. Flowering period: March - June.	Not expected. Habitat does not occur in project area. No clay soils occur in the project site. Closest observation is over two miles from the project site.
Smooth tarplant (*Centromadia pungens* spp. *laevis*)	--/-- CRPR 1B.1	Herb. Occurs in riparian/watercourse, grassland, and alkali scrub. Does well in disturbed areas. Elevation range: 295 – 1640 feet. Flowering period: April - September.	Not expected. Closest observation to the site was over two miles to the southeast. The site is above the elevation range for the species.
Long-spined spineflower (*Chorizanthe polygonoides* var. *longispina*)	--/-- CRPR 1B.1	Herb. Occurs in chaparral, sage scrub, grassland, often in clay soils. Elevation range: 98 – 4,921 feet. Flowering period: April - July.	Not expected. Chaparral and sage scrub not present. No clay soils occur on site.
Paniculate tarplant (*Deinandra paniculata*)	--/-- CRPR 4.2	Herb. Occurs in valley grassland, usually in non-wetland and occasionally in wetlands. Elevation range: 0 – 4330 feet. Flowering period: April – November.	Present. This species was observed on site during the general biological survey.
Spreading navarretia (*Navarretia fossalis*)	FT/-- CRPR 1B.1	Herb. Occurs in vernal pools. Elevation range: 98 – 4,265 feet. Flowering period: April - June.	Not expected. No vernal pools occur on site.

Attachment C (cont.)

Table 2
POTENTIAL FOR LISTED OR SENSITIVE ANIMALS TO OCCUR ON-SITE

Species	Sensitivity Status*	Habitat	Status On Site
Cooper's hawk (*Accipiter cooperii*)	--/WL	Oak groves, mature riparian woodlands, and eucalyptus stands or other mature forests.	Present. This species was observed on site during the general biological survey.
Southern California rufous-crowned sparrow (*Aimophila ruficeps canescens*)	--/WL	Hillsides, with grassland, sage scrub, or chaparral.	Moderate. Species has been observed north of the site less than half a mile away. The disturbed nature of the project site makes it less likely to support this species.
California glossy snake (*Arizona elegans occidentalis*)	--/SSC	Scrub and grassland habitats, usually with loose or sandy soils. A generalist.	Low. Non-native grassland and sandy loam soils are present but are heavily disturbed due to human activity.
Burrowing owl (*Athene cunicularia*)	--/SSC	Grassland, fallow agriculture, and areas of sparse cover, preferably with burrows of fossorial mammals.	Low. Habitat with low potential occurs in the study area. This species was observed 0.5 mile north of the site in 2015. Most records of this species in the area occur east of the 215 freeway. Burrowing resources on site were minimal.
Crotch bumblebee (*Bombus crotchii*)	--/--	Scrub and grassland habitats. Uses sage, sunflowers, and similar species for nectar.	Low. This species was observed near (or possibly on) the site in 1982. Grassland and sunflowers were present on site. No records of the species on or near the site have been documented within the last 37 years.
Western pond turtle (*Clemmys marmorata pallida*)	--/SSC	Slow-moving streams, ponds, reservoirs, other water bodies deeper than 6 feet with logs or other submerged cover.	Not expected. Species record in the vicinity of the project site is from 1933. The population was documented as being extirpated at that time.
Orange-throated whiptail (*Cnemidophorus hyperthrus*)	--/WL	Chaparral, sage scrub, grassland, woodland, riparian areas.	Moderate. Species was observed within 0.5 mile of the project site in 1999. Suitable grassland and riparian habitat occur on site.
Coastal western whiptail (*Cnemidophorus tigris stenjnegeri*)	--/SSC	Open rocky areas with sparse vegetation usually scrub or grassland.	Moderate. Species was observed within 0.5 mile of the project site in 1999. Suitable rock outcrops, sparse vegetation, and grassland occur on site.
Red-diamond rattlesnake (*Crotalus ruber*)	--/SSC	Heavy brush, boulders, can use a variety of habitats. Prey density a determining factor.	Moderate. Species observed within 2.5 miles of the site in 2006. Boulders and ground squirrels observed on site.

Attachment C (cont.)

Table 2 (cont.)
POTENTIAL FOR LISTED OR SENSITIVE ANIMALS TO OCCUR ON SITE

Species	Sensitivity Status*	Habitat	Status On Site
Stephens' kangaroo rat (*Dipodomys stephensi*)	FE/ST	Open areas with sparse perennial cover and loose soil.	Moderate. Multiple observations were made within 0.5 mile of the site as recently as 2017. The site has sparse cover but is highly disturbed by dumping. No kangaroo rat nests were observed during the general biological survey.
Southern grasshopper mouse (*Onychomys torridus ramona*)	--/SSC	Grassland and sparse sage scrub.	Not expected. Closest observation occurred in 1923. More recent observations are south of Diamond Valley Lake.
Coast horned lizard (*Phrynosoma coronatum blainvillei*)	--/SSC	Grassland, scrub, chaparral, woodland.	Moderate. Grassland habitat occurs on site and this species was observed within half a mile of the site in 2003.
Coastal California gnatcatcher (*Polioptila californica californica*)	FT/SSC	Coastal sage and other low scrub.	Not expected. Habitat for species does not occur on site.
Western spadefoot (*Scaphiopus hammondii*)	--/SSC	Grassland, sage scrub or occasionally chaparral. Standing water, puddles, vernal pools, needed for reproduction.	Low. Species was observed 0.5 miles from the project site in 2009; however, no vernal pools or standing water were noted on site at the time of the general biological survey.

Attachment D

Explanation of Status Codes for Plant and Animal Species

FEDERAL AND STATE CODES

U.S. Fish and Wildlife Service (USFWS)

BCC	Bird of Conservation Concern
BGEPA	Bald and Golden Eagle Protection Act
FC	Federal candidate species
FE	Federally listed endangered
FPD	Federally proposed for delisting
FPE	Federally proposed endangered
FPT	Federally proposed threatened
FT	Federally listed threatened

USFWS Birds of Conservation Concern (BCC)

The primary legal authority for Birds of Conservation Concern (2008) is the Fish and Wildlife Conservation Act of 1980 (FWCA), as amended. Other authorities include the Endangered Species Act, Fish and Wildlife Act (1956) and 16 USC §701. A FWCA 1988 amendment (Public Law 100-653, Title VIII) requires the Secretary of the Interior through the USFWS to "identify species, subspecies, and populations of all migratory non-game birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973." The 2008 BCC report is the most recent effort by the USFWS to carry out this proactive conservation mandate.

The BCC report aims to identify accurately the migratory and non-migratory bird species (beyond those already designated as federally threatened or endangered) that represent the USFWS' highest conservation priorities and draw attention to species in need of conservation action. The USFWS hopes that by focusing attention on these highest priority species, the report will promote greater study and protection of the habitats and ecological communities upon which these species depend, thereby ensuring the future of healthy avian populations and communities. Birds of Conservation Concern 2008 lists are available online at https://www.fws.gov/birds/management/managed-species/birds-of-conservation-concern.php.

USFWS Federal Candidate (FC) Species

Federal candidate species are those for which the USFWS has on file "sufficient information on biological vulnerability and threats to support a proposal to list as endangered or threatened, but for which preparation and publication of a proposal is precluded by higher-priority listing actions. [The USFWS] maintain[s] this list for a variety of reasons: to notify the public that these species are facing threats to their survival; to provide advance knowledge of potential listings that could affect decisions of environmental planners and developers; to provide information that may stimulate conservation efforts that will remove or reduce threats to these species; to solicit input from interested parties to help us identify those candidate species that may not require protection under the [Endangered Species Act] or additional species that may require the Act's protections; and to solicit necessary information for setting priorities for preparing listing proposals" (Federal Register 70:90 [May 11, 2005]).

Attachment D (cont.)

USFWS Federal Proposed Endangered (FPE) Species

Any species the Service has determined is in danger of extinction throughout all or a significant portion of its range and the Service has proposed a draft rule to list as endangered. Proposed endangered species are not protected by the take prohibitions of section 9 of the ESA until the rule to list is finalized. Under section 7(a)(4) of the ESA, federal agencies must confer with the Service if their action will jeopardize the continued existence of a proposed species.

USFWS Federal Proposed Threatened (FPT) Species

Any species the Service has determined is likely to become endangered within the foreseeable future throughout all or a significant portion of its range and the Service has proposed a draft rule to list as threatened. Proposed threatened species are not protected by the take prohibitions of section 9, consistent with any protective regulations finalized under section 4(d) of the ESA, until the rule to list is finalized. Under section 7(a)(4) of the ESA, federal agencies must confer with the Service if their action will jeopardize the continued existence of a proposed species.

USFWS Bald and Golden Eagle Protection Act (BGEPA)

In 1782, Continental Congress adopted the bald eagle as a national symbol. During the next one and a half centuries, the bald eagle was heavily hunted by sportsmen, taxidermists, fisherman, and farmers. To prevent the species from becoming extinct, Congress passed the Bald Eagle Protection Act in 1940. The Act was extremely comprehensive, prohibiting the take, possession, sale, purchase, barter, or offer to sell, purchase, or barter, export or import of the bald eagle "at any time or in any manner."

In 1962, Congress amended the Eagle Act to cover golden eagles, a move that was partially an attempt to strengthen protection of bald eagles, since the latter were often killed by people mistaking them for golden eagles. The golden eagle, however, is accorded somewhat lighter protection under the Act than the bald eagle. Another 1962 amendment authorizes the Secretary of the Interior to grant permits to Native Americans for traditional religious use of eagles and eagle parts and feathers.

California Department of Fish and Wildlife (CDFW)

SCE	State candidate for listing as endangered
SCT	State candidate for listing as threatened
SE	State listed endangered
SR	State listed rare
ST	State listed threatened
SSC	State species of special concern
WL	Watch List
FP	Fully Protected species refers to all vertebrate and invertebrate taxa of concern to the Natural Diversity Data Base regardless of legal or protection status. These species may not be taken or possessed without a permit from the Fish and Game Commission and/or CDFW.
Special Animal	Refers to all vertebrate and invertebrate taxa of concern to the Natural Diversity Database regardless of legal or protection status.

Attachment D (cont.)

California Environmental Quality Act (CEQA)

For plants with no current federal or state legal standing, "CEQA" refers to the fact that under the Act, impacts to species may be found significant under certain circumstances (e.g., the species are regionally sensitive and/or are protected by a local policy, ordinance, or habitat conservation plan; or the impact involves interference with certain movements or migrations, with wildlife corridors or with nursery sites).

County of Riverside

Multiple Species Habitat Conservation Plan (MSHCP) Covered

MSHCP Covered Species indicates that the species is part of a proposed list of species (146 total) considered at this time to be adequately conserved by the Western Riverside County MSHCP, provided that participants meet all conditions listed in the Final MSHCP. These species are discussed in Section 2.1.4 and 9.2 of the MSHCP, Volume 1.

Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Group Designation

Group 1 – Take coverage is warranted based upon regional or landscape level considerations, such as healthy population levels, widespread distribution throughout the MSHCP Plan Area, and life history characteristics that respond to habitat-scale conservation and management actions.

Group 2 – Take coverage is warranted based upon regional or landscape level considerations with the addition of site-specific conservation and management requirements that area clearly identified in the MSHCP for species that are generally well distributed but that have core habitats that require conservation.

Group 3 – Take coverage is warranted based upon site-specific considerations and the identification of specific conservation and management conditions for species within a narrowly defined habitat or limited geographic area within the MSHCP Plan Area.

Western Riverside County Multiple Species Habitat Conservation Plan (MSHCP) Special Species Acronyms/Abbreviations

NEPSSA	Narrow Endemic Plant Species Survey Area species – Designated Area where focused surveys are required for plant species that are highly restricted by their habitat affinities, edaphic requirements, or other ecological factors, and for which specific conservation measures have been identified in Section 6.1.3 of the MSHCP, Volume I.
CASSA	Criteria Area Species Survey Area – Designated areas where focused surveys for specific species are required. These are species for which existing available information is not sufficient, and for which specific conservation measures have been identified in Section 6.3.2 of the MSHCP, Volume I.
Planning Species	Subsets of Covered Species that are intended to provide guidance for MSHCP Reserve assembly in Cores, Linkages, and Area Plans.

Attachment D (cont.)

OTHER CODES AND ABBREVIATIONS

California Native Plant Society California Rare Plant Rank (CRPR) Codes

Lists

1A = Presumed extirpated in California and either rare or extinct elsewhere. Eligible for state listing.

1B = Rare, threatened, or endangered in California and elsewhere. Eligible for state listing.

2A = Presumed extirpated in California but common elsewhere. Eligible for state listing.

2B = Rare, threatened, or endangered in California but more common elsewhere. Eligible for state listing.

3 = Review List: Plants about which more information is needed. Some eligible for state listing.

4 = Watch List: Plants of limited distribution. Needs monitoring for changes in population status. Few (if any) eligible for state listing.

List/Threat Code Extensions

.1 = Seriously threatened in California (over 80 percent of occurrences threatened/high degree and immediacy of threat)

.2 = Moderately threatened in California (20-80% occurrences threatened / moderate degree and immediacy of threat)

.3 = Not very threatened in California (less than 20% of occurrences threatened / low degree and immediacy of threat or no current threats known)

A “CA Endemic” entry corresponds to those taxa that only occur in California.

All List 1A (presumed extinct in California) and some List 3 (need more information; a review list) plants lacking threat information receive no extension. Threat Code guidelines represent only a starting point in threat level assessment. Other factors, such as habitat vulnerability and specificity, distribution, and condition of occurrences, are considered in setting the Threat Code.

Photo 1: Center of site looking southeast. Non-native grasses dominate the foreground with mule fat scrub in the background.

Photo 2: Typical non-native grassland, looking northeast from the center of the site.

Representative Site Photos

Attachment E

Photo 3: Disturbed flat-topped buckwheat scrub along the western edge of the site.

Photo 4: Typical disturbed habitat. Photo taken along the western edge of the site, looking north.

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Photo 5: Typical tamarisk scrub at the southern end of the project site. Photo is facing north.

Photo 6: Typical mule fat scrub habitat along the eastern boundary of the project site.

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Photo 7: Existing bike jumps in western central portion of site. Photo is facing north.

Photo 8: Trash was observed throughout the site.

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Photo 9: The presence of rodent burrows mean there is a potential for burrowing owls to occur on site.

Appendix C

Cultural Reports

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Enchanted Hills Park Project

Cultural Resources Survey

January 2020 | COP-04

Prepared for:

City of Perris
Community Service Department
5510 135 North D Street
City of Perris, CA 92570

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

Stacie Wilson
Senior Archaeologist

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Enchanted Hills Park Project

Cultural Resources Survey

Prepared for:

City of Perris
Community Service Department
135 North D Street
City of Perris, CA 92570

Prepared by:

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

January 2020 | COP-04

National Archaeological Database Information

Authors:	Stacie Wilson, M.S., RPA and Theodore G. Cooley, M.A. RPA, with contributions by Annie McCausland, M.A.
Firm:	HELIX Environmental Planning, Inc.
Client/Project:	City of Perris / Enchanted Hills Park Project
Report Date:	January 2020
Report Title:	Cultural Resources Survey for the Enchanted Hills Park Project, City of Perris, Riverside County, California
Submitted to:	City of Perris
Type of Study:	Cultural Resources Survey
New Sites:	None
Updated Sites:	None
USGS Quad:	Steele Peak 7.5' Quadrangle
Acreage:	Approximately 22.5 acres
Key Words:	Riverside County; Township 4 South, Range 4 West; City of Perris; Weston Road, West Metz Road; granitic bedrock; negative survey

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ACRONYMS AND ABBREVIATIONS

AB	Assembly Bill
AMSL	above mean sea level
APN	Assessor’s Parcel Number
BMX	bicycle motocross
CCR	California Code of Regulations
CEQA	California Environmental Quality Act
CHRIS	California Historical Resources Information System
CRHR	California Register of Historical Resources
CSR	California Southern Railway
EIC	Eastern Information Center
HELIX	HELIX Environmental Planning, Inc.
MLD	Most Likely Descendent
NAHC	Native American Heritage Commission
NRHP	National Register of Historic Places
OHP	Office of Historic Preservation
PRC	Public Resources Code
SLF	Sacred Lands File
USGS	U.S. Geological Survey

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EXECUTIVE SUMMARY

HELIX Environmental Planning, Inc. (HELIX) was contracted by the City of Perris (City) to provide cultural resources services for the Enchanted Hills Park Project (project), located in the City of Perris, in northwestern Riverside County, California. The proposed project consists of a neighborhood park within an approximately 22.5-acre site. A cultural resources study including a records search, Sacred Lands File search, Native American outreach, a review of historic aerial photographs and maps, and a pedestrian survey was conducted for the project. This report details the methods and results of the cultural resources study and has been prepared to comply with the California Environmental Quality Act (CEQA).

The records search conducted at the Eastern Information Center (EIC) on November 12, 2019 indicated that 15 previous cultural resources studies have been conducted within one mile of the project area, none of which occurred within the project site. The records search results also indicated that a total of 19 cultural resources have been previously recorded within one mile of the project area; however, no sites have been recorded within the project site. The field investigations included intensive pedestrian survey of the project area by HELIX archaeologists and a Native American monitor on November 25, 2019. The survey did not result in the identification of any cultural resources within the project area.

Based on the results of the current study, no cultural resources will be affected by the project. However, due to the cultural sensitivity of the general project region and Tribal requests, it is recommended that an archaeological monitoring program be implemented for ground-altering activities related to the construction of the project.

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1.0 INTRODUCTION

HELIX Environmental Planning, Inc. (HELIX) was contracted by the City of Perris (City) to provide cultural resources services for the proposed Enchanted Hills Park Project (project), which would involve the development of a park within an approximately 22.5-acre area. A cultural resources study including a records search, Sacred Lands File search, Native American outreach, a review of historic aerial photographs and maps, and a pedestrian survey was conducted for the project property. This report details the methods and results of the cultural resources study and has been prepared to comply with the California Environmental Quality Act (CEQA).

1.1 PROJECT LOCATION

The project site is located in the City of Perris in northwestern Riverside County, in the northeast 1/4 of the southwest 1/4 of Section 25 of Township 4 South, Range 4 West, on the U.S. Geological Survey (USGS) 7.5' Steele Peak quadrangle (Figure 1 and 2, *Regional Location* and *USGS Topography*, respectively). The approximately 22.5-acre project site is bordered by Weston Road to the south and West Metz Road to the north, with Altura Drive adjacent to the east and Carter Drive to the west (Figure 3, *Aerial Photograph*). The project is within Assessor Parcel Numbers (APN) 326-062-017, 326-071-001, -002, 326-072-002, -003, -004, -005, and 326-073-001.

1.2 PROJECT DESCRIPTION

The proposed project consists of a neighborhood park. Currently the project site is largely undeveloped; however, there are several trails, a BMX (bicycle motocross) course, signs of disturbance, and man-made features. Through a series of community outreach efforts, the City prepared a conceptual plan for the project (Figure 4, *Conceptual Site Plan*). The plan includes a combination of passive and active recreational features; while many natural features of the site will be retained, park development would include the introduction of hardscape and impermeable surfaces, as well as turfed and landscaped areas. The park will include a multi-use field, a child play area, a toddler play area, restrooms, picnic shelters, hardscape, parking lots, bridges, trails, a basketball court, BMX course improvements, art rocks, a splash pad, a skating area, and a zip line. Additionally, the project would retain and incorporate some of the existing site features, such as Owl Rock, which is a painted boulder, and an existing BMX course that has been built by neighbors. The conceptual plan also identifies a detention basin near the Weston Road project entrance. There are three entrances to the site: one at the intersection of Weston Road and Diana Street, and two entrances that form a horse-shoe drive adjacent to and accessible from Metz Road. One parcel within the larger study area is not included as a part of the project, as the City has been unable to acquire it (APN 326-072-001).

1.3 REGULATORY FRAMEWORK

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Significant resources are those resources which have been found eligible to the California Register of Historical Resources (CRHR).

CEQA Public Resources Code (PRC) 21084.1, and California Code of Regulations (CCR) Title 14 Section 15064.5, address determining the significance of impacts to archaeological and historic resources and discuss significant cultural resources as "historical resources," which are defined as:

- resource(s) listed or determined eligible by the State Historical Resources Commission for listing in the CRHR (14 CCR Section 15064.5[a][1]);
- resource(s) either listed in the National Register of Historic Places (NRHP) or in a "local register of historical resources" or identified as significant in a historical resource survey meeting the requirements of Section 5024.1(g) of the PRC, unless "the preponderance of evidence demonstrates that it is not historically or culturally significant" (14 CCR Section 15064.5[a][2]);
- resources determined by the Lead Agency to meet the criteria for listing on the CRHR (14 CCR Section 15064.5[a][3]).

For listing in the CRHR, a historical resource must be significant at the local, state, or national level under one or more of the following four criteria:

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

B. It is associated with the lives of persons important to local, California, or national history;

C. It 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;

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

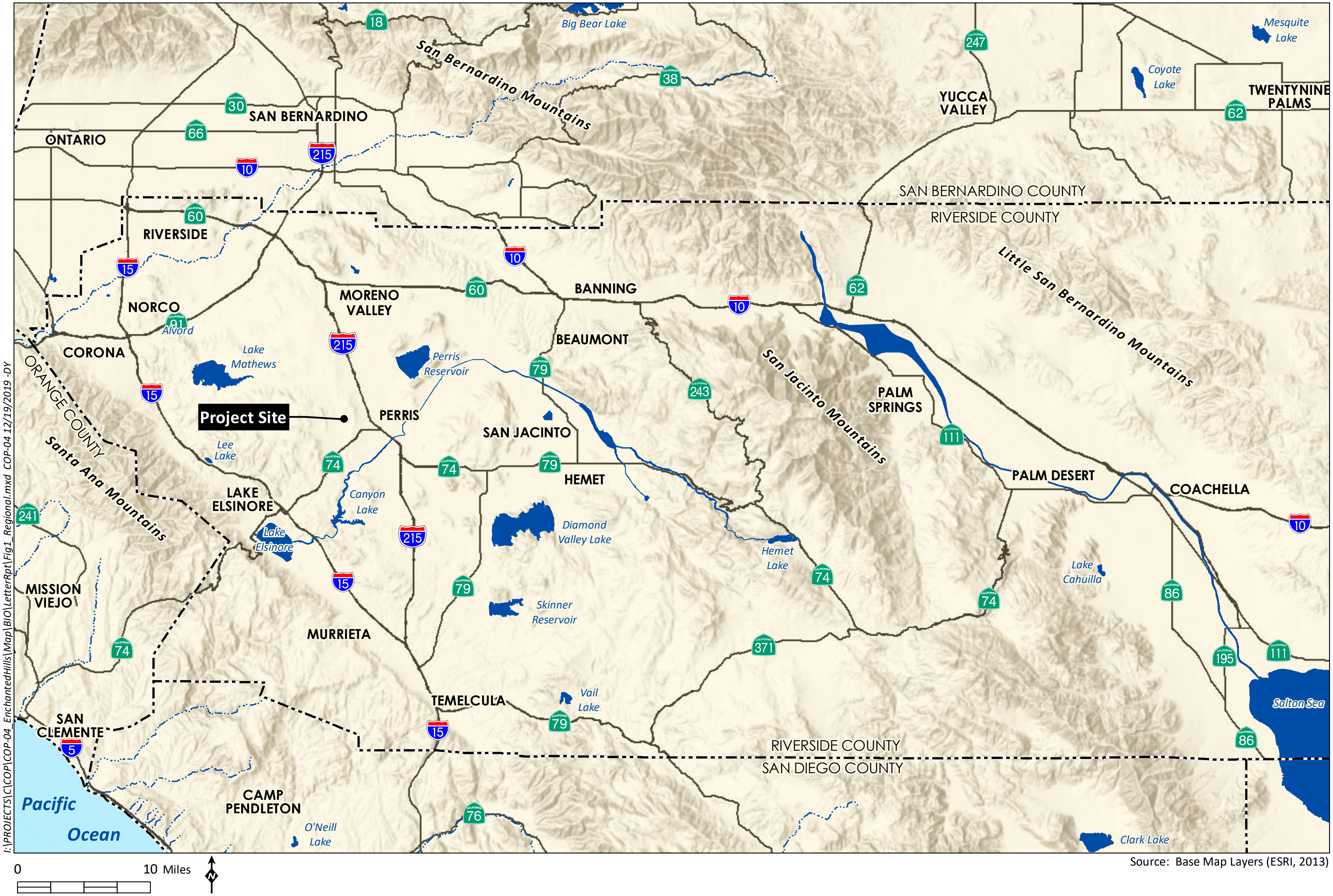
Under 14 CCR Section 15064.5(a)(4), a resource may also be considered a "historical resource" for the purposes of CEQA at the discretion of the lead agency.

All resources that are eligible for listing in the CRHR must have integrity, which is the authenticity of a historical resource's physical identity evidenced by the survival of characteristics that existed during the resource's period of significance. Resources, therefore, must retain enough of their historic character or appearance to be recognizable as historical resources and to convey the reasons for their significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. In an archaeological deposit, integrity is assessed with reference to the preservation of material constituents and their culturally and historically meaningful spatial relationships. A resource must also be judged with reference to the particular criteria under which it is proposed for nomination.

California State Assembly Bill (AB) 52 revised PRC Section 21074 to include Tribal Cultural Resources as an area of CEQA environmental impact analysis. Further, per new PRC Section 21080.3, a CEQA lead agency must consult with any California Native American tribe that requests consultation and that is traditionally and culturally affiliated with the geographic area of a proposed project to identify resources of cultural or spiritual value to the tribe, even if such resources are already eligible as historical resources as a result of cultural resources studies.

1.3.1 City of Perris General Plan

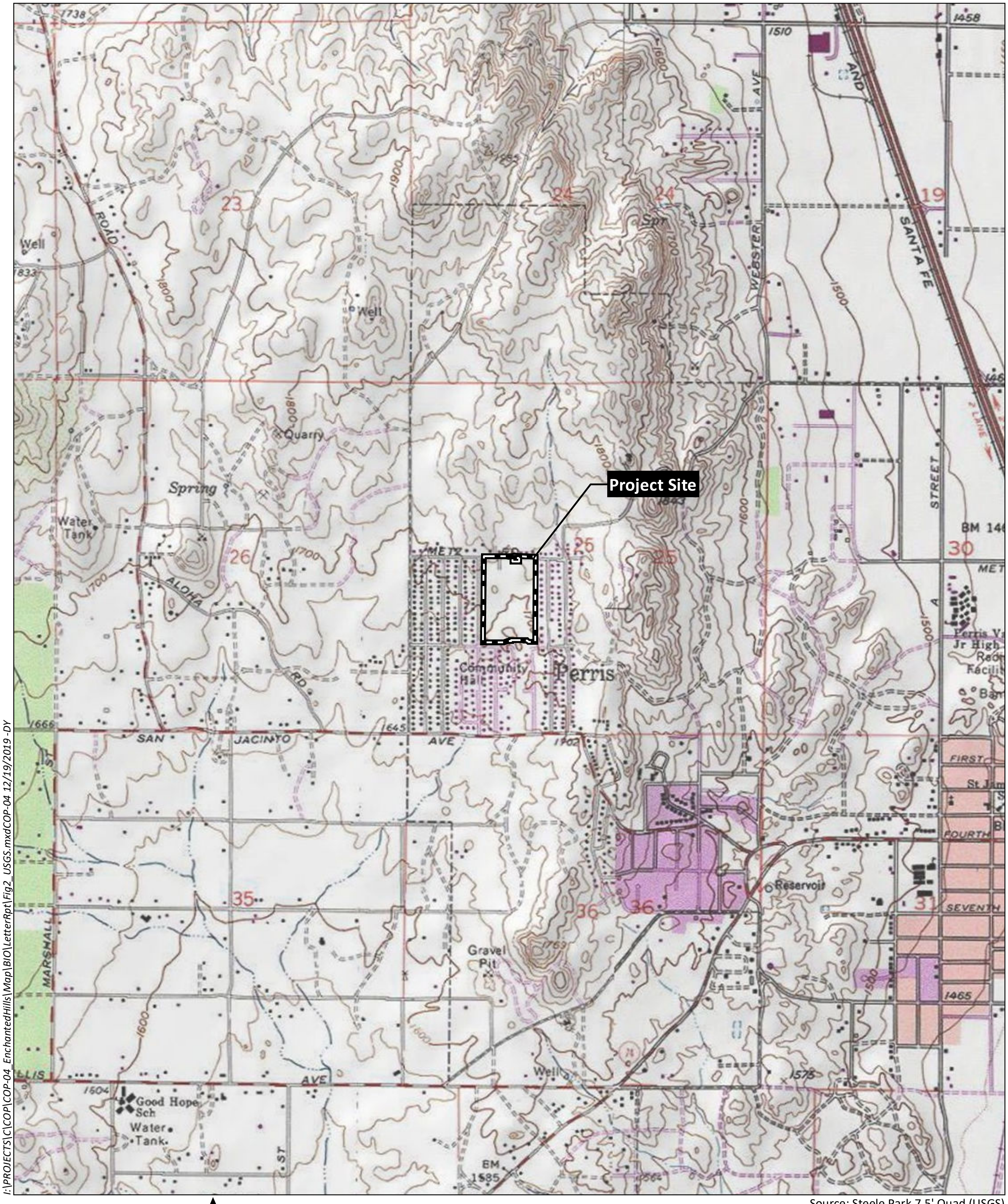
The Conservation Element of the City's General Plan (2005) includes a Cultural Resource Sensitivity map (Exhibit CN 6), with sensitive zones found in areas of exposed bedrock, at the center of the City, and



HELIX Environmental Planning

Regional Location

Figure 1



Source: Steele Park 7.5' Quad (USGS)

HELIX Environmental Planning

USGS Topography

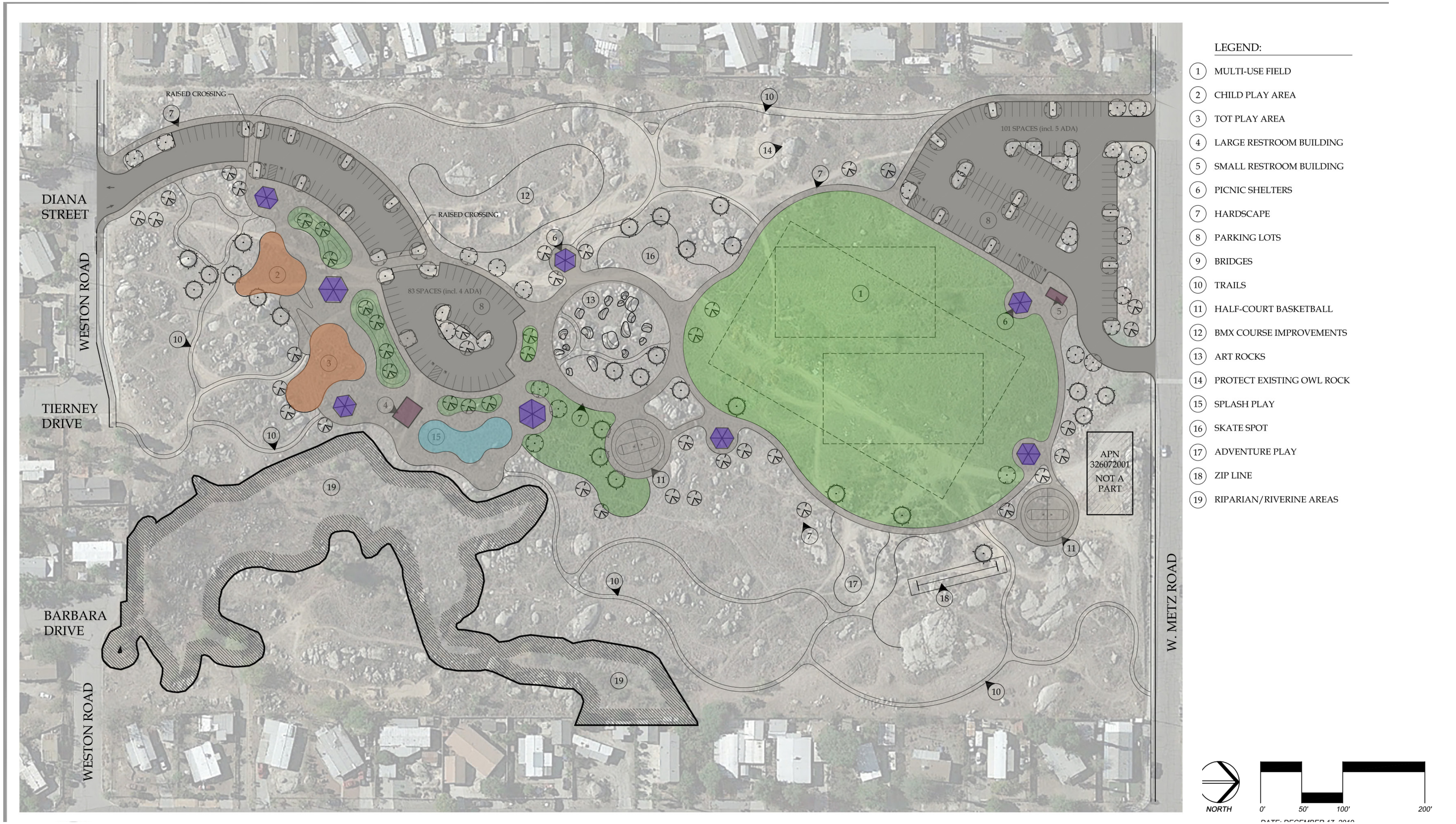
Figure 2

Source: Aerial (RCIT, 2016)

HELIX
Environmental Planning

Aerial Photograph

Figure 3



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Source: City of Perris 2019

HELIX Environmental Planning

Conceptual Site Plan

Figure 4

along historic road alignments (City of Perris 2005). The Perris Valley Historical Association, along with the Riverside County Office of Historic Preservation, have identified historic sites and structures within the City of Perris, all of which occur in the downtown area of the City.

Within the project area, the cultural resources sensitivity is indicated as low on the Cultural Resource Sensitivity map, with a density of one or fewer sites being probable over a quarter-mile area. Cultural resources sensitivity levels are higher, however, within the Motte Rimrock Reserve located to the north of the project area, where a large area of medium density site probability exists (City of Perris 2005; Exhibit CN 6).

1.4 PROJECT PERSONNEL

Stacie Wilson, M.S., RPA served as principal investigator and is the primary author of this technical report. Ms. Wilson meets the qualifications of the Secretary of Interior's Standards and Guidelines for archaeology and is a Riverside County Approved Cultural Resources Consultant. Theodore Cooley, M.A., RPA is coauthor of this technical report, Annie McCausland, M.A., contributed to the report, and Mary Robbins-Wade, M.A, RPA provided senior technical review. Julie Roy, B.A. and Mary Villalobos, B.A. conducted the field survey. Frank Morreo from the Soboba Band of Luiseño Indians participated in the pedestrian survey. Resumes for key project personnel are presented in Appendix A.

2.0 PROJECT SETTING

2.1 NATURAL SETTING

The project area is located within the Perris Valley, along the elevated northwestern part of the San Jacinto River watershed system. The San Jacinto River is approximately three miles to the southeast of the project area; Lake Elsinore, the terminus of the river, is approximately 9.5 miles to the southwest.

Site topography is relatively flat within the project area, with a slight slope from the north to the south. Elevation ranges from about 1,732 feet above mean sea level (AMSL) to approximately 1,690 feet AMSL, with shallow colluvial and alluvial sediments in the central area and rocky knolls throughout the remainder of the project area.

The project area is characterized by undeveloped land, the majority of which consists of natural, low rocky hill terrain with shallow alluvial and colluvial fan deposits in the central area of the property. Geologically, the rocky hill terrain of the project site is mapped as being underlain by the late Cretaceous era, Val Verde tonalite, a granitic rock of the Peninsular Ranges Batholith (Morton n.d.). Numerous bedrock outcrops are present within the project property, and Bissell and Morgan (1990:1) have noted in nearby areas containing similar geologic circumstances with numerous granitic boulder outcrops that "these outcrops were frequently used in the prehistoric past for shelter, as surfaces for rock art (both pictographs and petroglyphs) and as grinding surfaces on which to reduce hard seeds". In addition to the processing of hard seeds, granitic outcrops were also used by native populations for the processing of multiple other vegetal and small mammal food resources, and were likely used for tanning hides, mixing pigments, and other uses.

Soil series mapped for the project area include the Cieneba and Hanford soil series (Natural Resources Conservation Service [NRCS] 2019). In the rocky hill areas on the western and eastern sides of the property, the soil type is Cieneba rocky sandy loam, 8 to 15 percent slopes, eroded. Through the central area of the property the soil type is Hanford coarse sandy loam, 2 to 8 percent slopes. The Cieneba soils constitute roughly 80 percent of the property and the Hanford soils the remaining 20 percent. Cieneba soils form on granitic bedrock, while Hanford soils form on alluvial fan landforms (NRCS 2019).

While the rocky knoll areas currently contain mostly non-native grassland and weeds with intermittent areas of remnant sage scrub vegetation, prehistorically, the project vicinity would have likely supported coastal sage scrub habitat, which includes vegetation such as California sagebrush, California buckwheat, and purple sage, with intermittent areas of native grassland (California Native Plant Society 1997). Plants of these native vegetation communities and possibly other native vegetation supported by the soils on-site would have been used by the Luiseño people for food, medicine, tools, shelter, ceremonial and other uses (Bean and Shipek 1978; Sparkman 1908). Many of the animal species found living within this habitat (such as rabbits, deer, small mammals, and birds) would have been used by native populations as well.

2.2 PREHISTORIC CONTEXT

Moratto (1984) has previously defined eight archaeological regions and 16 subregions for California. The location of the project places it within the boundary of the San Diego subregion of the Southern Coast Region, but it is also located adjacent to the boundary with the Colorado River subregion of the Desert Region (Moratto 1984: 148, Figure 4.13). The following culture history outlines and briefly describes the known prehistoric cultural Traditions and chronology of archaeological sites in the vicinity of the project. The approximately 10,000 years of documented prehistory of the region has often been divided into three periods: Early Prehistoric Period (San Dieguito Tradition/complex), Archaic Period (Milling Stone Horizon, Encinitas Tradition, La Jolla and Pauma complexes), and Late Prehistoric Period (Cuyamaca and San Luis Rey complexes).

Prior to 1984, when Moratto defined the San Diego subregion, little archaeological investigation had occurred in the westernmost Riverside and San Bernardino counties portion of this subregion. This paucity of archaeological information limited the ability of researchers to assess the cultural and temporal associations for the archaeological resources in this part of the subregion. One of the few early studies to occur in this area prior to 1984 was conducted near Temecula in the early the 1950s at a site identified as the ethnohistoric village of *Temeku* (McCown 1955). The investigation produced a substantial, primarily Late Prehistoric Period, artifact assemblage, but with some possible late Archaic materials as well. Another study, conducted in the 1970s, for the construction of the nearby Perris Reservoir (O'Connell et al. 1974, eds.), consisted of investigations at several sites and was, perhaps, the most extensive study conducted in the area prior to 1984. The results, which included several radiocarbon dates, indicated a predominance of occupation at the sites during the Late Prehistoric Period, after AD 1500, but with some limited evidence for occupation as early 380 BC (Bettinger 1974:159-162). During the last approximately 35 years since 1984, several substantial archaeological studies have occurred that have served to substantially augment the archaeological record for the area (e.g., Grenda 1997; Applied Earth Works, Inc. 2001). Based on the information provided by these and other subsequent studies in the area, Sutton and Gardner (2010) and others have recently begun to define the prehistory of this area of the San Diego subregion and how it fits in with the previously better-known areas of the subregion. The three chronological periods defined for the prehistory of the San Diego subregion are described below.

2.2.1 Early Prehistoric Period

The Early Prehistoric Period represents the time of the entrance of the first known human inhabitants into California. In some areas of California, it is referred to as the Paleo-Indian period and is associated with the Big-Game-Hunting activities of the peoples of the last Ice Age occurring during the Terminal Pleistocene (pre-10,000 years ago) and the Early Holocene (beginning circa 10,000 years ago) (Erlandson 1994, 1997; Erlandson et al. 2007). In the western United States, the most substantial evidence for the Paleo-Indian or Big-Game-Hunting peoples, derives from finds of large fluted spear and projectile points (Fluted-Point Tradition) at sites in places such as Clovis and Folsom in the Great Basin and the Desert Southwest (Moratto 1984:79–88). In California, most of the evidence for the Fluted-Point Tradition derives principally from areas along the western margins of the Great Basin including the eastern Sierras and the Mojave Desert, and in the southern Central Valley (Dillon 2002; Rondeau et al. 2007). Elsewhere in California, with the exception of a site in the north coast ranges in northwestern California, CA-LAK-36, only isolated occurrences of fluted spear points have occurred, scattered around the state (Dillon 2002; Rondeau et al. 2007). These isolated occurrences have, however, included two fluted points or fluted point fragments recently discovered in, or in close proximity to, the San Diego subregion; one in the mountainous eastern area of San Diego County approximately 50 miles to the southeast of the project area (Kline and Kline 2007) and another along the coast approximately 36 miles to the southwest of the project area in adjacent Orange County (Fitzgerald and Rondeau 2012). Two examples have also been discovered to the south in Baja California (Des Lauriers 2008; Hyland and Gutierrez 1995). Despite these isolated occurrences of fluted points in the San Diego subregion and Baja California, none have been found to date in the western Riverside or San Bernardino counties area (Dillon 2002; Rondeau et al. 2007).

The earliest sites in the San Diego subregion, documented to be over 9,000 years old, belong to the San Dieguito Tradition (Warren et al. 1998; Warren and Ore 2011). The San Dieguito Tradition, with an artifact assemblage distinct from that of the Fluted Point Tradition, has been documented mostly in the coastal and near coastal areas in San Diego County (Carrico et al. 1993; Rogers 1966; True and Bouey 1990; Warren 1966; Warren and True 1961), as well as in the southeastern California deserts (Rogers 1939, 1966; Warren 1967). The content of the earliest component of the C.W. Harris site (CA-SDI-149/316/4935B), located along the San Dieguito River in San Diego County, formed the basis upon which Warren and others (Rogers 1966; Vaughan 1982; Warren 1966, 1967; Warren and True 1961) identified the "San Dieguito complex," which Warren later reclassified as the San Dieguito Tradition (1968). This Tradition is characterized by an artifact inventory consisting almost entirely of flaked stone biface and scraping tools, but lacking the fluted points associated with the Fluted-Point Tradition. Diagnostic artifact types and categories associated with the San Dieguito Tradition include elongated bifacial knives; scraping tools; crescentics; and Silver Lake, Lake Mojave, and leaf-shaped projectile points (Rogers 1939; Warren 1967; Knell and Becker 2017). Some researchers interpret the San Dieguito Tradition/complex as having a primarily, but not exclusively, hunting subsistence orientation, but sufficiently hunting-oriented as to be distinct from the more gathering-oriented complexes of traits that were to follow in the Archaic Period (Warren 1968; Warren et al. 1998). Other researchers see the San Dieguito subsistence system as less focused on hunting and more diversified, and, therefore, possibly ancestral to or a developmental stage for the subsequent, predominantly gathering-oriented, Encinitas Tradition, denoted in the San Diego area as the "La Jolla/Pauma complex" (cf. Bull 1983; Ezell 1987; Gallegos 1985, 1987, 1991; Koerper et al. 1991). While little definite evidence for the San Dieguito Tradition has been discovered in other coastal and near-coastal areas of southern California outside of San Diego County, some evidence for it has been recently discovered in the eastern mountains of

San Diego County (Pigniolo 2005) and in a coastal area to the west in Los Angeles County (Sutton and Grenda 2012).

2.2.2 Archaic Period

During the subsequent Archaic Period, artifact assemblages of the Milling Stone Horizon/Encinitas Tradition occur at a range of coastal and adjacent inland sites and, in contrast to those of the previous Early Prehistoric Period, are relatively common in the study area region. These assemblages appear to indicate that a relatively stable, sedentary, predominantly gathering complex, possibly associated with one people, was present in the coastal and immediately inland areas of southern California for more than 7,000 years (Grenda 1997; Sutton and Gardner 2010; Warren 1968; Warren et al. 1998).

Warren has proposed that during the Archaic Period in the south coastal region, the Encinitas Tradition began circa 8,500 years ago and extended essentially unchanged until circa 1,500 years ago (Warren 1968:2; Warren et al. 1998). Also, during the Archaic Period in the coastal region, beginning somewhere north of San Diego and extending to Santa Barbara, a fourth cultural assemblage, variously described as the Intermediate Horizon (Wallace 1955) or Campbell Tradition (Warren 1968), has been delineated and distinguished, following the Milling Stone Horizon/Encinitas Tradition. This assemblage is distinguished from earlier Archaic assemblages by the presence of large projectile points and milling tools such as the mortar and pestle. The time period of this assemblage is viewed as beginning circa 4,800 years ago and continuing to as late as 1,300 years ago (Warren 1968). While still a matter of some debate, Warren and others (1998) have subsequently termed the time period encompassing the extent of the Intermediate/ Campbell cultural assemblage, in the southernmost coastal region, as the Final Archaic Period.

In the vicinity of the project area (approximately five miles to the northeast), archaeological investigations conducted in Perris Valley for the Perris Reservoir project produced a single radiocarbon date of circa 2200 years before present (BP) and a few diagnostic artifacts as the only evidence for a late Archaic Period occupation at the archaeological sites investigated (Bettinger 1974:159-162). More recently, the Eastside Reservoir (subsequently renamed Diamond Valley Lake) Project involved construction of a large new reservoir within the Domenigoni and Diamond valleys, located approximately 13.5 miles southeast of the study area. Prior to construction of the reservoir, large-scale archaeological investigations were conducted for the project (Goldberg 2001; Robinson 2001). Based on the results from this project, the researchers developed a local chronology specific to the Domenigoni and Diamond valleys based on projectile point style changes and associated radiocarbon dates (Robinson 2001). The terminology in this chronology resembles that already presented above with the period from 9,500 to 7,000 years ago designated as the Early Archaic period, the period from 7,000 to 4,000 years ago as the Middle Archaic, and the period from 4,000 to 1,500 years ago as the Late Archaic. In the Eastside Reservoir Project, only two components could be firmly dated to the Early Archaic, but sparse evidence of Early Archaic activity was noted in six other localities. One site did, however, produce two radiocarbon dates of 9190±50 and 9310±60 BP (McDougall 2001). For the Middle Archaic, firm evidence was documented in 14 locations, with other traces at four other sites. During the Late Archaic, a profusion of activity and occupation was evident, with 23 firmly dated site components and sparse evidence at eight other localities (Goldberg 2001:524).

Another archaeological investigation, conducted in proximity to the project area, has also produced evidence for prehistoric occupation in the western Riverside County region during the earliest part of the Archaic Period. This investigation occurred at Lake Elsinore, located approximately 10 miles to the southwest of the study area (Grenda 1997). This natural lake is situated in a fault-created basin whose principal source of water in prehistoric times was the San Jacinto River (Grenda 1997:3). Archaeological investigations conducted at a site located along the old lake shoreline indicated occupation as early as 8,500 years ago (Grenda 1997). Thus, prehistoric occupation during the Archaic Period in the study area vicinity is documented to have occurred possibly as early as 9,300 years ago, and remained present to the end of the period, approximately 1,500 years ago. While this temporal extent correlates with Warren's original proposed extent of the Encinitas Tradition, refinement of his characterization of the Tradition as being a relatively stable, sedentary, predominantly gathering complex, possibly associated with one people, and with an extent mostly restricted to the San Diego County area, may now, based on new information available, be subject to some revision (cf. Sutton and Gardner 2010).

2.2.3 Late Prehistoric Period

The beginning of the Late Prehistoric Period, circa 1,500 years ago, is seen as marked by a number of rather abrupt changes. The magnitude of these changes and the short period of time within which they took place are reflected in significant alteration of previous subsistence practices and the adoption of significant new technologies. As discussed further below, some of this change may have been as a result of significant variations in the climatic conditions. Subsistence and technological changes that occurred include a shift from hunting using atlatl and dart to the bow and arrow; a de-emphasizing of shellfish gathering along some areas of the coast (possibly due to silting-in of the coastal lagoons); and an increase in the storage of crops, such as acorns and pinyon nuts. Other new traits introduced during the Late Prehistoric Period include the production of pottery and cremation of the dead, and, in the western Riverside County area, a shift in settlement pattern is apparent (cf. Wilke 1974).

This shift in settlement is first noted during the early part of the period from 1,500 to 750 years ago, and is evidenced, locally, in the results from the Eastside Reservoir Project by a rather sudden decline in occupation in the local area during the initial part of the period. This 750-year period was termed by the Eastside Reservoir researchers as the Saratoga Springs Period, following Warren's (1984) desert terminology. This period can also be seen to partially coincide with a warm and arid period known as the Medieval Warm Period, documented to have occurred between approximately 1,100 and 600 years ago (Jones et al. 1999; Kennett and Kennett 2000; Stine 1994). During this period, at least two episodes of severe drought have also been demonstrated, the first calibrated to between 1060 and 840 BP and the second between 740 and 650 BP (Goldberg 2001; Stine 1994). Goldberg (2001) hypothesized that the Medieval Warm Period could account for the decline in sites occurring in the Eastside Reservoir Project area during the Saratoga Springs Period (1500 to 750 BP), claiming that desert and inland areas of western Riverside County, such as where the Eastside Reservoir Project and the current study area are located, would no longer be suitable to support residential bases. Goldberg (2001) further hypothesized that settlements would possibly be clustered at more suitable water sources during this time, such as at the coast, Lake Cahuilla, or Lake Elsinore (cf. Wilke 1974). While a decline was noted during the initial part of the Saratoga Springs Period, subsequently, during the latter part of the period, during the time of the Medieval Warm Period, a reoccupation began to occur (Goldberg 2001:578). According to Goldberg, "When components dating to the Medieval Warm segment of the Saratoga Springs Period are segregated and combined with Medieval Warm components from the Late Prehistoric Period, it shows that the frequency of refuse deposits and artifact and toolstone caches during the Medieval Warm is slightly higher than during the Late Archaic and much higher than during the later portion of the Late Prehistoric Period (2001:578).

In the Eastside Reservoir Project, the Late Prehistoric Period was defined as extending from the end of the Saratoga Springs Period (750 BP) to 410 BP. A subsequent Protohistoric Period was also defined as extending from 410 to 150 BP. The Late Prehistoric (750–410 BP) was characterized by the presence of Cottonwood points, although research indicated that Cottonwood points had actually begun to appear in the Eastside Reservoir Project study area as early as 950 BP. Ceramics and abundant obsidian begin to appear around the time of the Cabrillo exploration in AD 1542; thus this date (i.e., circa 410 BP) until the establishment of the mission system in the late 1700s was defined as the Protohistoric Period (Robinson 2001). It should also be noted that the end of the Saratoga Springs Period and the beginning of the Late Prehistoric Period, 750 BP, also coincides with the onset of the Little Ice Age, generally dated from 750 to 150 BP (Goldberg 2001; Sutton et al. 2007). During this period, the climate was cooler and moister, and the sites identified within the Eastside Reservoir Project study area reflected a substantial increase in number and diversity, longer occupation periods, and more sedentary land use. Similar intensification of land use also occurred during this time in neighboring San Gorgonio Pass (Bean et al. 1991) and Perris Valley (Wilke 1974).

2.3 ETHNOGRAPHIC CONTEXT

While some ethnographers place the area of the project within or adjacent to a transitional area between two related cultural groups, the Cahuilla and Luiseño (Bean 1972, 1978; Bean and Shipek 1978), Kroeber places it firmly within the traditional territory of the Luiseño people (1925: Plate 57). The Luiseño and Cahuilla, along with the nearby Gabrielino, Juaneño, and Cupeño people, comprise the Cupan group of the Takic subfamily of the Uto-Aztecan linguistic stock (Bean and Vane 1979; Miller 1986; Shipley 1978).

2.3.1 Cahuilla

The Cahuilla term *?ivi?lyu?atum* (or *īvīatim*) refers to those who speak the Cahuilla language and is also a recognition of a commonly shared cultural tradition (Bean 1972; Strong 1929). Prehistorically, the Cahuilla territory was topographically diverse, occupying elevations from 11,000 feet in the San Bernardino Mountains to below sea level at the Salton Sea (Bean 1978). The Cahuilla are thought to have been in part distinguished from other Uto-Aztecan -speaking groups by mountain ranges and plains, but they are known to have interacted regularly with these and other groups through trade, intermarriage, ritual, and war. Cahuilla villages were commonly situated within canyons extending into mountain ranges or on nearby alluvial fans, typically near sources of water and food (Bean 1978; Bean et al. 1991). The diverse habitat of the Cahuilla enabled a wide variety of plant and animal species to be used for food, goods manufacture, and medicine (Bean 1978).

2.3.2 Luiseño

The name Luiseño derives from Mission San Luis Rey de Francia and has been used to refer to the Native people associated with the mission. The Luiseño followed a seasonal gathering cycle, with bands occupying a series of campsites within their territory (Bean and Shipek 1978; White 1963). The Luiseño lived in semi-sedentary villages usually located along major drainages, in valley bottoms, and also on the coastal strand, with each family controlling gathering areas (Bean and Shipek 1978; Sparkman 1908; White 1963). True (1990) has indicated that the predominant determining factor for placement of villages and campsites was locations where water was readily available, preferably on a year-round basis. While most of the major Luiseño villages known ethnographically were located closer to the coast along the Santa Margarita River Valley and the San Luis Rey River Valley (Bean and Shipek 1978; Kroeber 1925; White 1963), Kroeber (1925) does indicate general locations for three Luiseño villages in more inland areas. He places the village of *Panache* in proximity to Lake Elsinore and the confluence of the

San Jacinto River and Temescal Creek, approximately 10 miles to the southwest of the project area, and the villages of *Temeku* and *Meha* in the vicinity of the confluence of the upper Santa Margarita River and Temecula Creek, approximately 23 miles to the southeast of the project area (Kroeber 1925: Plate 57; McCown 1955:1). Kroeber also indicates a general location for the Gabrielino village of *Pahav* along Temescal Creek approximately 12 miles to the west of the project area (Kroeber 1925: Plate 57).

It must be noted that interpretation by archaeologists and linguistic anthropologists may differ from the beliefs and traditional knowledge of the Luiseño people. The Luiseño creation story indicates that the Luiseño people have always been here, not migrating from elsewhere. The creation story of the Pechanga Band of the Luiseño tells that the world was created at Temecula. “The Káamalam [first people] moved to a place called Nachíivo Pomíisavo, but it was too small, so they moved to a place called ‘exva Teméeku,’ this place you know now as Temeku. Here they settled while everything was still in darkness (DuBois 1908)” (Masiel-Zamora 2013:2). A traditional Luiseño story tells of a great flood, and the people went to higher ground, where they were saved. The San Luis Rey Band say that this higher ground where the people were saved is Morro Hill. Some Luiseño informants indicated the place in this story is a hill just east of Highway 395 in the San Luis Rey River Valley (Cupples and Hedges 1977).

2.4 HISTORICAL BACKGROUND

2.4.1 Spanish Period

While Juan Rodriguez Cabrillo visited San Diego briefly in 1542, the beginning of the historic period in the San Diego area is generally given as 1769. In the mid-18th century, Spain had escalated its involvement in California from exploration to colonization (Weber 1992), and in that year a Spanish expedition headed by Gaspar de Portolá and Junípero Serra established the Royal Presidio of San Diego. Portolá then traveled north from San Diego seeking suitable locations to establish military presidios and religious missions in order to extend the Spanish Empire into Alta California. Initially, both a mission and a military presidio were located on Presidio Hill overlooking the San Diego River. A small pueblo, now known as Old Town San Diego, developed below the presidio. The Mission San Diego de Alcalá was constructed in its current location five years later. The missions and presidios stood, literally and figuratively, as symbols of Spanish colonialism, importing new systems of labor, demographics, settlement, and economies to the area. Cattle ranching, animal husbandry, and agriculture were the main pursuits of the missions.

The first documented Spanish contact in what is now Riverside County was by Spanish military captain Juan Bautista de Anza who led expeditions in 1774 and 1775 from Sonora to Monterey (Bolton 1930). Anza embarked on the initial expedition to explore a land route northward through California from Sonora, with the second expedition bringing settlers across the land route to strengthen the colonization of San Francisco (Rolle 1963). Anza’s route led from the San Jacinto Mountains northwest through the San Jacinto Valley, which was named “San José” by Anza. Little documentation exists of Anza’s route being used after the two expeditions, although it was likely used to bring Spanish supplies into the newly colonized Alta California (Lech 2004). In 1781, the Spanish government closed the route due to uprisings by the Yuman Indians. However, by that time, the missions were established and self-sufficient; thus, the need for Spanish supplies from Sonora had begun to diminish.

Although Riverside County proved to be too far inland to include any missions within its limits, Missions San Juan Capistrano and San Luis Rey de Francia, established in 1776 and 1798 respectively, claimed a large part of southwestern Riverside County. Due to the inland geographical location of the Cahuilla territory, the Spanish missions did not have as direct an effect on them as it did on the Luiseño who lived along the coast (Bean 1978). On the coast, the Luiseño were moved into the Mission environment, where living conditions and diseases promoted the decline of the Luiseño population (Bean and Shipek 1978). However, throughout the Spanish Period, the influence of the Spanish progressively spread further from the coast and into the inland areas of southern California as Missions San Luis Rey and San Gabriel extended their influence into the surrounding regions and used the lands for grazing cattle and other animals.

In the 1810s, ranchos and mission outposts called *asistencias* were established, increasing the amount of Spanish contact in the region. An asistencia was established in Pala in 1818 and in San Bernardino in 1819. Additionally, Rancho San Jacinto was established for cattle grazing in the San Jacinto Valley to the east of the project area (Brigandi 1999). In 1820, Father Payeras, a senior mission official, promoted the idea that the San Bernardino and Pala *asistencias* be developed into full missions in order to establish an inland mission system (Lech 2004). However, Mexico won its independence from Spain in 1821, bringing an end to the Spanish Period in California.

2.4.2 Mexican Period

Although Mexico gained its independence from Spain in 1821, Spanish patterns of culture and influence remained for a time. The missions continued to operate as they had in the past, and laws governing the distribution of land were also retained in the 1820s. Following secularization of the missions in 1834, large ranchos were granted to prominent and well-connected individuals, ushering in the Rancho Era, with the society making a transition from one dominated by the church and the military to a more civilian population, with people living on ranchos or in pueblos. With the numerous new ranchos in private hands, cattle ranching expanded and prevailed over agricultural activities.

In order to obtain a rancho, an applicant submitted a petition containing personal information and a land description and map (diseño). In 1835, Jose Antonio Estudillo of San Diego submitted a petition for the San Jacinto Rancho, located approximately three miles northeast of the project area. Although Estudillo's petition was for four square leagues (approximately 30,000 acres), in 1842 he was granted close to the maximum size allowed of 11 square leagues (Lech 2004; State Lands Commission 1982). In 1845, Estudillo's son-in-law, Miguel de Pedrorena filed a petition for half of the San Jacinto Viejo Rancho and a small additional portion of land two miles to the northeast in the hills east of Lamb Canyon (Lech 2004). This portion, the northern half of the San Jacinto Viejo Rancho, became known as the San Jacinto Nuevo y Potrero Rancho.

2.4.3 American Period

American governance began in 1848, when Mexico signed the Treaty of Guadalupe Hidalgo, ceding California to the United States at the conclusion of the Mexican–American War. A great influx of settlers to California occurred during the American Period, resulting from several factors, including the discovery of gold in the state in 1848, the end of the Civil War, the availability of free land through passage of the Homestead Act, and later, the importance of San Diego County as an agricultural area supported by roads, irrigation systems, and connecting railways. The increase in American and European populations quickly overwhelmed many of the Spanish and Mexican cultural traditions, and greatly increased the rate of population decline among Native American communities.

Initially southern California was divided into only two counties: Los Angeles and San Diego. In 1853, San Bernardino County was added, placing what is now Riverside County primarily within San Diego County and partially within San Bernardino County. Riverside County was formed in 1893.

2.4.4 City of Perris

Southern California was developed by Americans and other immigrants who migrated to the western frontier in pursuit of gold and other mining, agriculture, trade, and land speculation (Lech 2004). This population growth during the early years of the American Period brought a need for mail and freight travel.

Although the first transcontinental railroad was completed in 1869 to northern California, in the 1870s the Southern Pacific Railroad Company, incorporated in 1865 and consolidated in 1870, began to construct a southern route that would traverse the state (Fickewirth 1992). In the early 1880s, the California Southern Railway (CSR), a subsidiary of the Atchison, Topeka and Santa Fe Railway Company (Santa Fe), was completed and allowed for travel through the Cajon Pass to Barstow to a junction of the Atlantic and Pacific Railroad and down to San Diego through western Riverside County. New depots were needed along the CSR route; surveys for both the railway and depot locations were led by CSR chief engineer Fred Perris. CSR purchased land from Southern Pacific Railroad in the Pinacate Valley (Perris Valley) for one of the new depots and town site (Plates 1 and 2). Local citizens offered to erect a depot, dig a well, and donate a number of lots to the railroad in exchange for establishing a station at the new town site (City of Perris n.d.). The townsite and station were named after Mr. Perris.

Plate 1. Perris Depot, circa 1890s. Courtesy of the City of Perris.

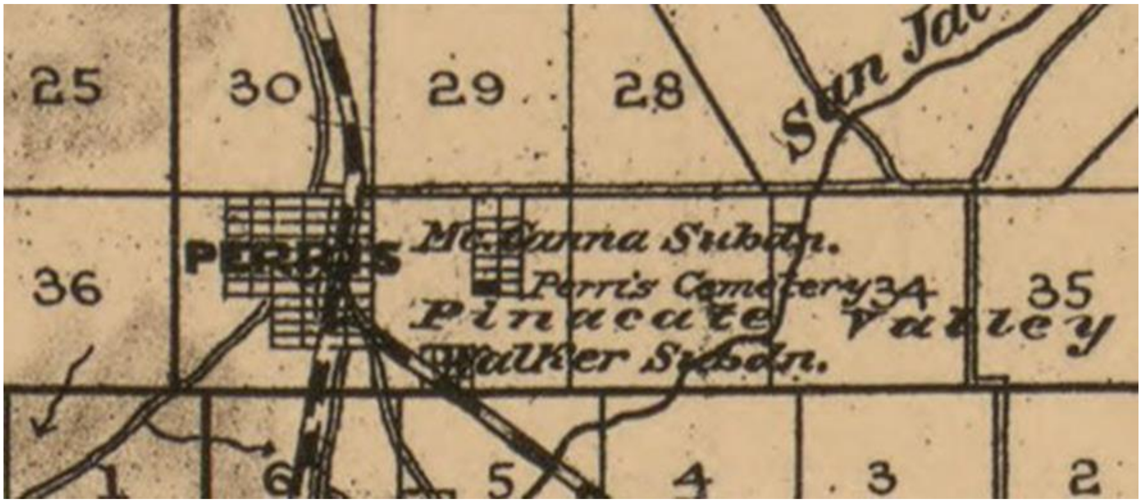

Plate 2. Perris Township on the Official Map of San Diego County, 1890
by T.D. Beasley. Courtesy of the Library of Congress.

In 1887, Santa Fe officials consolidated their family of railroads in southern California, forming the California Central Railway. Although the CSR remained an individual subsidiary at that time, it consolidated with the California Central Railway and the Redondo Beach Railway two years later, in 1889. The resulting corporation was the Southern California Railway Company, wholly owned by Santa Fe (Price 1988). In 1906, all of lines of Southern California Railway Company were deeded to the Atchison, Topeka and Santa Fe Railway Company.

On April 1, 1886 Perris became an official station along the ATSF transcontinental route. By 1887, six passenger trains and two freight trains stopped at Perris daily, and rapid growth followed for several years. In the 1890s the railway through Temecula gorge (south of Perris) to San Diego was discontinued due to repeated flood damage. This meant fewer people would be traveling through Perris. In response the town had to shift its economic growth towards agriculture (The Perris Valley Historical & Museum Association 2016).

In 1892 the Perris Indian school was founded in the town of Perris (Plate 3). This was the first Indian boarding school not located on a reservation. Students came from a variety of tribes from as far north as the Tule River agency. Students consisted of all ages between 5 and 20 years old. The 80-acre site was at the corner of today's Perris Boulevard and Morgan Street. The main subjects taught were agricultural and domestic science. Due to an inadequate water supply to conduct these subjects at the school, a better location was sought. By 1901 a site in the City of Riverside was found on the corner of Magnolia and Jackson Streets. On July 19, 1901 the cornerstone was laid for the new school building of Sherman Institute. Perris Indian School remained in operation until December 1904 when the remaining students were transferred to the Riverside School site (Sherman Indian Museum n.d.).

Plate 3. Perris Indian School, circa 1890. Courtesy of the Sherman Indian Museum.

The lack of water prompted the need for local government in the unincorporated rural community. In early 1911, Perris residents submitted a petition to Riverside County supervisors seeking incorporation. On April 18, 1911, the community voted on the petition; 101 votes were cast, a majority for cityhood. On May 26, 1911, Perris became an officially incorporated city. It is estimated that the City's population in 1911 was about 300 people. By 1920, the City had grown to 499 people (City of Perris n.d.).

In the early 1950s the Eastern Municipal Water district brought much needed water to Perris. Alfalfa, King potato, and sugar beets were the primary crops during the twentieth century. The annual Rods, Rails and Potato festival in June celebrates the valley's agricultural past (City of Perris n.d.).

The construction of Lake Perris in the late 1960s and early 1970s made Perris a recreational destination for Riverside County residents. Hot air ballooning and skydiving are also popular recreational activities in the City (City of Perris n.d.).

3.0 ARCHIVAL RESEARCH AND CONTACT PROGRAM

3.1 RECORDS SEARCH

HELIX staff conducted a record search of the California Historical Resources Information System (CHRIS) at the Eastern Information Center (EIC) on November 12, 2019. The records search covered a one-mile radius around the project area and included the identification of previously recorded cultural resources and locations and citations for previous cultural resources studies. A review of the California Historical Resources listings, the state Office of Historic Preservation (OHP) historic properties directories, and the NRHP was also conducted. The records search summary and map are included as Appendix B (Confidential Appendices, bound separately).

3.1.1 Previous Surveys

The records search results identified 15 previous cultural resource studies within the record search limits, none of which occurred within or immediately adjacent to the project site (Table 1, *Previous Studies within One Mile of the Project Area*. Fourteen of the studies were cultural resource inventories, surveys, or assessments; one was a cultural resources construction monitoring report.

Table 1
PREVIOUS STUDIES WITHIN ONE MILE OF THE PROJECT AREA

Report Number (RI-)	Year	Author	Report Title
00250	1977	Leonard, N. Nelson III and Donna Belligio	An Archaeological Evaluation of the Proposed Road Improvements in the Mead Valley Vicinity, Riverside County, California
00887	1981	McCarthy, Daniel F.	Archaeological Survey of the Motte Rimrock Reserve, Riverside County, California
02324	1987	Hatheway, Roger G., Roger D. Mason, Kevin J. Peter, and Jeanette A. McKenna	Historic Property Survey Report, Highway 74 (Fourth Street) Widening, City of Perris, California
02759	1990	Arkush, Brooke	An Archaeological Assessment of Tentative Tracts 25160, 25334, and 25356, Located in Perris Valley in Western Riverside County, California
02776	1990	Lerch, Michael K. and Robert M. Yohe, II	Cultural Resources Assessment of Tentative Tract No. 24959 City of Perris, Riverside County, California
03788	1990	Drover, Christopher	An Archaeological Assessment of Parcel Map 26207, Riverside County, California
04404	2000	Jones and Stokes Associates, Inc.	Final Cultural Resources Inventory Report for the Williams Communications, Inc., Fiber Optic Cable System Installation Project, Riverside to San Diego, California
04779	2004	Schmidt, James J.	Letter Report: Riverside County Line Extension Projects
06748	2005	Fulton, Terri and Debbie McLean	Cultural Resources Assessment for a 3.11 Acre Subdivision, City of Perris, Riverside County, California
06832	2007	Fulton, Phil	Cultural Resources Assessment, Parcels 311090008, 311090010, and 311090011 in the City of Perris, Riverside County, California
07086	2007	Moreno, Adrian Sanchez	Archaeological Survey Report for Southern California Edison Company, Installation of Overhead Service and Poles (#4710105E, 4710106E, and 4710107E) Project, on the Arapaho 12kV Circuit, Riverside County, California, (WO#6077-1346, AI#7-1074)
07490	2007	Tang, Bai "Tom" and Michael Hogan	Historical/Archaeological Resources Survey Report: The Windflower TriStone Project Tentative Tract Map No. 35184
07829	2008	Bodmer, Clarence, Daniel Ballester, and Lara Shaker	Historical/Archaeological Resources Survey Report: Tentative Tract Map No. 32203, City of Perris, Riverside County, California
08528	2010	Schmidt, James J.	Letter Report: WO 6077-4800; 1-4841: Deteriorated Pole Replacement Project, Perris Area, Riverside County, California

Table 1 (cont.)
PREVIOUS STUDIES WITHIN ONE MILE OF THE PROJECT AREA

Report Number (RI-)	Year	Author	Report Title
08927	2013	Tang, Bai "Tom"	Archaeological Monitoring Program, Dollar General Project on Fourth Street near Park Avenue, APN 313-143-009; DPR 12-07-0011; GPA 12-07-0010, City of Perris, Riverside County, California

3.1.2 Previously Recorded Resources

The EIC has a record of 19 previously recorded cultural resources within a one-mile radius of the project, but none have been recorded within the project site (Table 2, *Previously Recorded Resources within One Mile of the Project Area).* The resources include 12 prehistoric archaeological sites, one multi-component site containing both a prehistoric component and a historic component, and six built environment historic buildings and/or structures. The prehistoric sites recorded within the records search limits consist of a habitation site with milling features, a rockshelter with a milling feature, and 10 bedrock milling feature sites. The multi-component site is recorded as a prehistoric habitation site with milling features and a historic component consisting of an abandoned quarry, a foundation, and an earthen dam. The six historic resources are historic addresses that include five private residences displaying varying types of architecture and dating to between circa 1900 and circa 1931, and one building complex described as the Palomar Military Academy, circa 1914, and then subsequently as the Perris Ranch.

Table 2
PREVIOUSLY RECORDED RESOURCES WITHIN ONE MILE OF THE PROJECT AREA

Primary Number (P-33-#)	Trinomial (CA-RIV-#)	Age	Description	Date, Recorder
000993	993	Prehistoric	One milling slick on a low boulder	1980, McCarthy
000994	994	Prehistoric	Two milling slicks on a low boulder	1980, McCarthy
001057	1057	Prehistoric/Historic	Prehistoric habitation site with milling features; historic abandoned quarry, foundation, earthen dam, and trash	1976, Leonard; 1979, McIntyre and Foster; 1990, Wade, Bowden-Renna, and Collett
007620	-	Historic	Vernacular adobe residence, circa 1931	1982, Hedges
007636	-	Historic	Vernacular ranch house, circa 1900	1982, Harmon
007678	-	Historic	Perris Ranch/Palomar Military Academy complex of vernacular and Spanish style structures, circa 1914	1982, Cross
012203	-	Historic	Rural vernacular wood frame building circa 1931	1992, Lee
012204	-	Historic	Mission style revival bungalow, circa 1930	1992, Lee
012206	-	Historic	Rural vernacular cottage, circa 1920	1992, Lee
015650	8207	Prehistoric	One milling slick on a boulder, and quartz flake	2007, Fulton

Table 2 (cont.)
PREVIOUSLY RECORDED RESOURCES WITHIN ONE MILE OF THE PROJECT AREA

Primary Number (P-33-#)	Trinomial (CA-RIV-#)	Age	Description	Date, Recorder
015651	8208	Prehistoric	Three bedrock milling features	2007, Fulton
015652	8209	Prehistoric	Two bedrock milling features	2007, Fulton
015653	8210	Prehistoric	Two bedrock milling features	2007, Fulton
015654	8211	Prehistoric	Three bedrock milling features	2007, Fulton
016675	8730	Prehistoric	Two milling slicks on a boulder	2007, Ballester
016910	-	Prehistoric	Nine bedrock milling features	2007, Wilson
016811	-	Prehistoric	Rockshelter and milling feature	2007, Wilson
017181	-	Prehistoric	Five bedrock milling features	2008, Fulton
017208	8955	Prehistoric	One milling slick on a boulder	2008, Kay

3.2 OTHER ARCHIVAL RESEARCH

Various additional archival sources were consulted, including historic topographic maps and aerial imagery. The purpose of this research was to identify historic structures and land use in the area.

The historic USGS topographic maps examined include the 1953, 1967, 1973, and 1978 Steele Peak (1:24,000); the 1901 Elsinore (1:125,000); and the 1901 Riverside (1:62,500) and 1942 Riverside (1:62,500) topographic maps. While no buildings or structures appear in the project area on any of these topographic maps, a roughly north-south trending dirt road is shown crossing through the project site on the 1901 Elsinore (1:125,000) and the 1953 Steele Peak (1:24,000) maps. However, this road is not shown on the subsequent 1967 Steele Peak (1:24,000) map.

The historic aerials consulted include photographic images dating to 1966, 1967, 1978, and 1994 (NETR Online 2019). No buildings or structures are shown within the project area on these aerial images. The mobile home tract surrounding the project area was established circa 1966 and was further developed until 1978 according to aerial photographs (NETR Online 2019). On the 1966 aerial photograph, the presence of multiple dirt roads across the property, possibly associated with the construction of adjacent residential development, appears to have obliterated any remnant of the dirt road that was visible on the 1953 topographic map.

3.3 NATIVE AMERICAN CONTACT PROGRAM

HELIX contacted the Native American Heritage Commission (NAHC) on December 11, 2019 for a Sacred Lands File (SLF) search and list of Native American contacts for the project area. The NAHC indicated in a response dated December 19, 2019 that no known sacred lands or Native American cultural resources are within the project area. Letters were sent on December 24, 2019 to Native American representatives and interested parties identified by the NAHC. Two responses have been received to date (Table 3, *Native American Contact Program Responses*). If any additional responses are received, they will be forwarded to City staff. Native American correspondence is included as Appendix C (Confidential Appendices, bound separately).

Table 3
NATIVE AMERICAN CONTACT PROGRAM RESPONSES

Contact/Tribe	Response
Agua Caliente Band of Cahuilla Indians (ACBCI)	Responded on January 9, 2020; the project area is not located within the boundaries of the ACBCI Reservation. However, it is within the Tribe's Traditional Use Area. The ACBCI THPO requests the following: *A copy of the records search with associated survey reports and site records from the information center. *A description of the proposed project. Please include information about any ground disturbing activities that may take place. *Copies of any cultural resource documentation (report and site records) generated in connection with this project.
Cahuilla Band of Indians	Responded on January 9, 2020; The Tribe does not have knowledge of any cultural resources within or near the project area. Although the project is located outside the Cahuilla reservation boundary, it is within the Cahuilla traditional land use area. Therefore, they do have an interest in this project. They believe that cultural resources may be unearthed during construction; they request tribal monitors from Cahuilla be present during all ground disturbing activities and to be notified of all updates with the project moving forward.

Per AB 52, a CEQA lead agency must consult with California Native American tribes that request consultation and that are traditionally and culturally affiliated with the geographic area of a proposed project to identify resources of cultural or spiritual value to the tribe, even if such resources are already eligible as historical resources as a result of cultural resources studies. The City has initiated consultation with the registered tribes, separate from this contact program; the consultation results will be addressed in the environmental document for the project.

4.0 FIELD SURVEY

4.1 SURVEY METHODOLOGY

An intensive pedestrian survey of the project site was conducted on November 25, 2019 by HELIX archaeologists Julie Roy and Mary Villalobos and Native American monitor Frank Morreo from the Soboba Band of Luiseño Indians. Where feasible, the project site was walked in transects spaced approximately 10 to 15 meters apart. Numerous granitic (tonalite) bedrock boulders are present in many areas of the property. Observed soils consisted of medium brown granitic sands.

Ground visibility was generally fair to good (ranging from 30 percent to 80 percent) throughout most of the project area (Plates 4 and 5); however the southeast portion of the project site exhibited poor visibility (less than 10 percent), where thick growths of grasses and weeds obscured the ground surface (Plate 6). Visibility was excellent (more than 80 percent) in portions of the project area that contained eroded soil and/or disturbed conditions (Plate 7). While the property is undeveloped, a considerable amount of ground disturbance is present from a variety of causes, including a BMX course in the southwest portion of the project area, where on-site soils and vehicle tires have been used to create ramps for jumping (see Plate 7). In addition, the south half of the project area is highly disturbed by modern dumping. Concrete piles, building material, domestic use items, mattresses, furniture, gravel, and other types of modern trash are scattered throughout this portion of the project area (Plate 8).

Plate 4. Overview from south end of project area (at Weston Road). View to the east.

Plate 5. Overview of central portion of project area. View to the west.

Plate 6. Area of dense vegetation in southeastern project area. View to the west.

Plate 7. Overview of bike ramps in southwest portion of survey area. View to the south.

Plate 8. Overview of modern trash in southern portion of project area. View to the north.

All bedrock outcrops and open ground were inspected for cultural modification and artifacts. Most of the bedrock in the project area is highly weathered. Many of the boulders appear to have been moved from their original position, and many appear to have been pushed into linear piles along the sides of Weston Road and West Metz Road, possibly during the creation of the roads.

4.2 SURVEY RESULTS

No cultural resources (prehistoric or historic) were observed within the project site during the field survey. While the project property is undeveloped, it was observed during the field survey to be disturbed by various modern activities, including the creation of several bike ramps, several dirt roads, and by the dumping of modern trash in some areas.

5.0 RESULTS

No cultural resources have been previously recorded within the project area, and no cultural material or features were observed within the project site during the field survey. Ground visibility varied, but overall was fair to good during the survey. The numerous bedrock outcrop surfaces were readily visible for examination for evidence of potential prehistoric milling features, and none were observed.

6.0 SUMMARY AND MANAGEMENT RECOMMENDATIONS

A study was undertaken to identify cultural resources that are present in the Enchanted Hills Park Project site and to determine the possible effects of the project on cultural resources.

The results from the current study, including the records search and cultural resources field survey did not identify any cultural resources within the project area; therefore, no impacts to cultural resources are anticipated.

6.1 MANAGEMENT RECOMMENDATIONS

Based upon the findings of the cultural resources study, the project is expected to have no impacts to significant cultural resources. However, the general vicinity of the project has been occupied/used by the Luiseño, Cahuilla, and other native people for thousands of years, and there are numerous previously recorded cultural resources within the vicinity of the project; the potential remains for buried cultural resources to be present within the project area. In addition, two tribes have responded that the area is of interest to the Tribe, as it is located within the Cahuilla Traditional Use Area. Based on these factors, the following standard measures are recommended:

MM CR 1: A professional archaeologist shall be retained prior to the issuance of grading permits. The task of the archaeologist shall be to monitor the initial ground-altering activities at the subject site for the unearthing of previously unknown archaeological and/or cultural resources. Selection of the archaeologist shall be subject to the approval of the City of Perris Director of Development Services, and no grading activities shall occur at the site until the archaeologist has been approved by the City. The archaeological monitor shall be responsible for maintaining daily field notes and a photographic record, and for reporting all finds to the City of Perris in a timely manner. The archaeologist shall be equipped to record and salvage cultural resources that may be unearthed during grading activities. The archaeologist shall be empowered to temporarily halt or divert grading equipment to allow recording and removal of the unearthed resources.

In the event that archaeological resources are discovered at the project site, the handling of the discovered resources will differ. However, it is understood that all artifacts with the exception of human remains and related grave goods or sacred/ceremonial objects belong to the property owner. All artifacts discovered at the development site shall be inventoried and analyzed by the professional archaeologist.

If any artifacts of Native American origin are discovered, all activities in the immediate vicinity of the find (within a 50-foot radius) shall stop and the project archaeologist shall notify the City of Perris Planning Division, the Pechanga Band of Luiseño Indians, the Soboba Band of Luiseño Indians, and any other tribes identified by the California Native American Heritage Commission (NAHC) as being affiliated with the area. A designated Native American observer from one of the tribes identified by the NAHC as being affiliated with the area shall be retained to help analyze the Native American artifacts for identification as everyday life and/or religious or sacred items, cultural affiliation, temporal placement, and function, as deemed possible. The significance of Native American resources shall be evaluated in accordance with the provisions of CEQA and shall consider the religious beliefs, customs, and practices of the Luiseño tribes. All items found in association with Native American human remains shall be considered grave goods or sacred in origin and subject to special handling.

Native American artifacts that are relocated/ reburied at the project site would be subject to a fully executed relocation/reburial agreement with the assisting Native American tribes or bands. This shall include measures and provisions to protect the reburial area from any future impacts. Relocation/ reburial shall not occur until all cataloging and basic recordation have been completed. Native American artifacts that cannot be avoided or relocated at the project site shall be prepared in a manner for curation at an accredited curation facility in Riverside County that meets federal standards per 36 CFR Part 79 and makes the artifacts available to other archaeologists/researchers for further study such as University of California, Riverside Archaeological Research Unit (UCR-ARU) or the Western Center for Archaeology and Paleontology (Western Science Center). If more than one Native American group is involved with the project and they cannot come to an agreement as to the disposition of Native American artifacts, they shall be curated at the Western Science Center by default. The archaeological consultant shall deliver the Native American artifacts, including title, to the accredited curation facility within a reasonable amount of time along with the fees necessary for permanent curation.

Non-Native American artifacts shall be inventoried, assessed, and analyzed for cultural affiliation, personal affiliation (prior ownership), function, and temporal placement. Subsequent to analysis and reporting, these artifacts will be subjected to curation or returned to the property owner, as deemed appropriate.

Once grading activities have ceased or the archaeologist, in consultation with the designated Native American observer, determines that monitoring is no longer necessary, monitoring activities can be discontinued following notification to the City of Perris Planning Division. A report of findings, including an itemized inventory of recovered artifacts, shall be prepared upon completion of the steps outlined above. The report shall include a discussion of the significance of all recovered artifacts. The report shall provide evidence that any Native American and non-Native American archaeological resources recovered during project development have been avoided, reburied, or curated at an accredited curation facility. A copy of the report shall also be filed with the EIC and submitted to the Pechanga Band of Luiseño Indians, the Soboba Band of Luiseño Indians, and any other Native American groups involved with the project.

MM CR 2: In the event that human remains (or remains that may be human) are discovered at the Project site during grading or earthmoving, the construction contractors, project archaeologist, and/or designated Native American observer shall immediately stop all activities within 100 feet of the find. The Project proponent shall then inform the Riverside County Coroner and the City of Perris Planning Division immediately, and the coroner shall be permitted to examine the remains as required by California Health and Safety Code Section 7050.5(b).

If the coroner determines that the remains are of Native American origin, the coroner would notify the Native American Heritage Commission (NAHC), which will identify the Most Likely Descendent (MLD). Despite the affiliation with any Native American representatives at the site, the NAHC's identification of the MLD will stand. The MLD shall be granted access to inspect the site of the discovery of Native American human remains and may recommend to the Project proponent means for treatment or disposition, with appropriate dignity of the human remains and any associated grave goods. The MLD shall complete his or her inspection and make recommendations or preferences for treatment within 48 hours of being granted access to the site. The disposition of the remains will be determined in consultation between the Project proponent and the MLD. In the event that the Project proponent and the MLD are in disagreement regarding the disposition of the remains, State law will apply and the mediation and decision process will occur with the NAHC (see Public Resources Code Section 5097.98(e) and 5097.94(k)).

The specific locations of Native American burials and reburials will be proprietary and not disclosed to the general public. The locations will be documented by the consulting archaeologist in conjunction with the various stakeholders and a report of findings will be filed with the EIC. If the human remains are determined to be other than Native American in origin, but still of archaeological value, the remains will be recovered for analysis and subject to curation or reburial at the expense of the project proponent. If deemed appropriate, the remains will be recovered by the Coroner and handled through the Coroner's Office. Coordination with the Coroner's Office would be through the City of Perris and in consultation with the various stakeholders.

7.0 REFERENCES

Applied Earth Works, Inc.
2001 *Metropolitan Water District of Southern California, Eastside Reservoir Project, Final Report of Archaeological Investigations*. Volumes I to V. General editor, Susan K. Goldberg. Report prepared for the Metropolitan Water District of Southern California, Los Angeles.

Bean, Lowell J.
1972 *Mukat's People*. University of California Press, Berkeley.

1978 Cahuilla. In *California*, edited by Robert F. Heizer, pp. 575–587. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington D.C.

Bean, Lowell J., and Florence C. Shipek
1978 Luiseño. In *California*, edited by Robert F. Heizer, pp. 550–563. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Bean, Lowell J., and Sylvia B. Vane (editors)
1979 *Native Americans of Western Riverside County California and the Devers-Mira Loma 500 kV Transmission Line Route (Lamb-Canyon-Mira Loma Section)*. Prepared by Cultural Systems Research, Inc., Menlo Park, California, for Southern California Edison Company, Rosemead, CA.

Bean, Lowell J., Sylvia B. Vane, and Jackson Young
1991 *The Cahuilla Landscape: The Santa Rosa and San Jacinto Mountains.* Ballena Press, Menlo Park, CA.

Bettinger, Robert L.
1974 Dating the Perris Reservoir Assemblages. In *Perris Reservoir Archaeology,* edited by James F. O'Connell, Phillip J. Wilke, Thomas F. King, and Carol L. Mix, pp. 159–162. California Department of Parks and Recreation Reports No. 14. Sacramento.

Bissell, Ronald M., and Marilyn Morgan
1990 *Cultural Resources Reconnaissance of the Winchester Hills Project Area, 2900 Acres in Riverside County, California*. Prepared by RMW Paleo Associates, Inc. Prepared for Planning and Design Solutions. Report on file at the Eastern Information Center, University of California, Riverside.

Bolton, Herbert E.
1930 *Anza's California Expeditions, Vols. I–IV*. University of California Press, Berkeley.

Brigandi, Phil
1999 The Outposts of Mission San Luis Rey. *Journal of San Diego History* 45(2):106–112.

Bull, Charles S.

1983 Shaking the Foundations: The Evidence for San Diego Prehistory. *Cultural Resource Management Casual Papers 1:15–64.* Department of Anthropology, San Diego State University.

California Native Plant Society

1997 Coastal scrubs – Holland Type and Status. Electronic document available at: http://davisherb.ucdavis.edu/cnpsActiveServer/holldetails.aspx?HOLLNAME=Coastal+scrubs, accessed on October 10, 2017.

Carrico, Richard L., Theodore G. Cooley, and Joyce M. Clevenger

1993 *Archaeological Excavations at the Harris Site Complex, San Diego County, California.* Report prepared by Ogden Environmental and Energy Services. Report on file at South Coastal Information Center, San Diego State University.

City of Perris

n.d. Perris History. Electronic document available at: http://www.cityofperris.org/about/history.html, accessed December 2019.

2005 *Perris Comprehensive General Plan 2030*, City of Perris, originally approved on April 26, 2005.

Cupples, Sue Ann, and Ken Hedges

1977 *San Luis Rey River Basin: Overview of Cultural Resources*. San Diego State University Foundation. Prepared for US Army Corps of Engineers. Electronic document available at: http://www.dtic.mil/dtic/tr/fulltext/u2/a146300.pdf, accessed May 16, 2018.

Dillon, Brian D.

2002 California Paleo-Indians: Lack of Evidence, or Evidence of a Lack? In *Essays in California Archaeology: A Memorial to Franklin Fenenga*. Edited by William J. Wallace and Francis A. Riddell. Contributions of the University of California Archaeological Research Facility, No. 60. Berkeley, California.

Des Lauriers, Matthew R.

2008 A Paleoindian Fluted Point from Isla Cedros, Baja, California. *Journal of Island & Coastal Archaeology* 3:271–276.

DuBois, Constance

1908 The Religion of the Luiseño Indians of Southern California. *University of California Publications in American Archaeology and Ethnology* 8(3):69-186.

Erlandson, Jon M.

1994 *Early Hunter-Gatherers of the California Coast*. Plenum Press, New York.

1997 The Middle Holocene along the California Coast. In *Archaeology of the California Coast during the Middle Holocene*, edited by J.M. Erlandson and M.A. Glassow. pp. 61–72. Perspectives in California Archaeology, Vol. 4, J.E. Arnold, series editor. Institute of Archaeology, University of California, Los Angeles.

Erlandson, Jon M., Torben C. Rick, Terry L. Jones, and Judith F. Porcasi

2007 One If by Land, Two If by Sea: Who Were the First Californians? In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Jones, pp. 53–62. Altamira Press, Lanham, Maryland.

Ezell, Paul

1987 The Harris Site: An Atypical San Dieguito Site, or Am I Beating a Dead Horse? In *San Dieguito-La Jolla: Chronology and Controversy*, edited by Dennis Gallegos, pp. 15–22. San Diego County Archaeological Society Research Paper Number 1.

Fickewirth, A. A.

1992 *California Railroads*. Golden West Books, San Marino, California.

Fitzgerald, Richard T., and Michael F. Rondeau

2012 A Fluted Projectile Point from Crystal Cove State Park, Orange County, Alta California. *California Archaeology* 4(2):247-256.

Gallegos, Dennis

1985 *Batiquitos Lagoon Revisited.* Cultural Resource Management Casual Papers 2(1). Department of Anthropology, San Diego State University.

1987 *San Dieguito-La Jolla: Chronology and Controversy*. San Diego County Archaeological Society, Research Paper 1.

1991 Antiquity and Adaptation at Agua Hedionda, Carlsbad, California. In *Hunter-Gatherers of Early Holocene Coastal California*, edited by J. M. Erlandson and R. H. Colten, pp. 19–42. Perspectives in California Archaeology, Vol. 1, J. E. Arnold, series editor. Institute of Archaeology, University of California, Los Angeles.

Goldberg, Susan

2001 Land Use, Mobility, and Intensification Evaluation and Refinement of the Model. In *Metropolitan Water District of Southern California, Eastside Reservoir Project, Final Report of Archaeological Investigations, Volume IV: Prehistoric Archaeology Synthesis of Findings*, edited by S. K. Goldberg, Chap. 14. Report prepared by Applied Earthworks, Hemet, California for Metropolitan Water District of Southern California, Los Angeles.

Grenda, Donn R.

1997 *Continuity & Change: 8,500 Years of Lacustrine Adaptation on the Shores of Lake Elsinore*. Statistical Research Technical Series 59, Tucson.

Hyland, Justin R., and Maria De La Luz Gutierrez

1995 An Obsidian Fluted Point from Central Baja California. *The Journal of California and Great Basin Anthropology* 17(1): 126–128.

Jones, Terry L., Gary M. Brown, L. Mark Raab, Janet L. McVicker, W. Geoffrey Spaulding, Douglas J. Kennett, Andrew York, and Phillip L. Walker

1999 Environmental Imperatives Reconsidered. Demographic Crisis in Western North America during the Medieval Climatic Anomaly. *Current Anthropology* 40:137–170.

Kennett, Douglas J., and James P. Kennett
2000 Competitive and Cooperative Responses to Climatic Instability in Coastal Southern California. *American Antiquity* 65:379–395.

Kline, George E., and Victoria L. Kline
2007 Fluted Point Recovered from San Diego County Excavation. *Proceedings of the Society for California Archaeology* 20:55–59.

Knell, Edward J., and Mark S. Becker
2017 Early Holocene San Dieguito Complex Lithic Technological Strategies at the C.W. Harris Site, San Diego, California. *Journal of California and Great Basin Anthropology* 37(2):183-201.

Koerper, Henry C., Paul E. Langenwalter II, and Adella Schroth
1991 Early Holocene Adaptations and the Transition Phase Problem: Evidence from the Allan O. Kelly Site, Agua Hedionda Lagoon. In *Hunter-Gatherers of Early Holocene Coastal California*, edited by J. M. Erlandson and R. H. Colton, pp. 43–62. Perspectives in California Archaeology, vol. 1, J.E. Arnold, series editor. Institute of Archaeology, University of California, Los Angeles.

Kroeber, A. L.
1925 *Handbook of the Indians of California*. American Bureau of Ethnology Bulletin 78. Washington, D.C. Lithographed edition 1953, Third Printing 1970, California Book Company, LTD, Berkeley.

Lech, Steve
2004 *Along the Old Roads: A History of the Portion of Southern California That Became Riverside County, 1772–1893*. Steve Lech, Riverside, California.

Masiel-Zamora, Myra Ruth
2013 *Analysis of 'Éxva Teméeku, A Luiseño Indian Village Site Named Temeku, Located in Temecula, California*. Master's thesis, Department of Anthropology, San Diego State University.

McCown, B. E.
1955 *Temeku. A Page from the History of the Luiseño Indians*. Archaeological Survey Association of Southern California Paper No. 3.

McDougall Dennis P.
2001 CA-RIV-5086/H. In *Metropolitan Water District of Southern California, Eastside Reservoir Project, Final Report of Archaeological Investigations, Volume II:* Archaic and Late Prehistoric Occupation Sites, edited by S. K. Goldberg, Chapt. 9. Prepared by Applied Earthworks, Hemet, California for Metropolitan Water District of Southern California, Los Angeles.

Miller, Wick R.
1986 Numic Languages. In *Great Basin*, edited by Warren L. D'Azevedo, pp. 98–112. Handbook of the North American Indians, Vol. 11. William C. Sturtevant, general editor. Smithsonian Institution, Washington, D.C.

Moratto, Michael J.
1984 *California Archaeology*. Academic Press.

Morton, Douglas M.
n.d. *Geologic Map of the Steele Peak 7.5' Quadrangle, Riverside County, California, version 1.0*. Publicly available, but undated preliminary map. United States Geological Survey.

Natural Resources Conservation Service
2019 *Web Soil Survey*. United States Department of Agriculture. Electronic document available at: http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx, accessed November 2019.

NETR Online
2019 *Historic Aerials*. Nationwide Environmental Title Research, LLC. Electronic document available at: http://www.historicaerials.com, accessed June 2019.

O'Connell, James F., Philip J. Wilke, Thomas F. King and Carol L. Mix, editors
1974 *Perris Reservoir Archaeology: Late Prehistoric Demographic Change in Southeastern California*. Report prepared by the Archaeological Research Unit, Department of Anthropology, University of California, Riverside, for the State of California Department of Parks and Recreation.

Pigniolo, Andrew R.
2005 A Different Context: San Dieguito in the Mountains of Southern California. *Proceedings of the Society for California Archaeology* 18:255-262.

Price, James N.
1988 The Railroad Stations of San Diego County. In *The Journal of San Diego History*, Spring 1988, Volume 34, Number 2. San Diego Historical Society Quarterly.

Robinson, Mark C.
2001 Units of Analysis. In *Metropolitan Water District of Southern California, Eastside Reservoir Project, Final Report of Archaeological Investigations, Volume IV: Prehistoric Archaeology Synthesis of Findings*, edited by S. K. Goldberg, Chapter 4. Prepared by Applied Earthworks, Hemet, California for Metropolitan Water District of Southern California, Los Angeles.

Rogers, Malcom

1939 Early Lithic Industries of the Lower Basin of the Colorado River and Adjacent Desert Areas. *San Diego Museum Papers* No. 3.

1966 *Ancient Hunters of the Far West*, edited by Richard F. Pourade, pp. 21-108. Copley Press, La Jolla, California.

Rolle, Andrew F.

1963 *California: A History*. Thomas Y. Crowell Company, New York, New York.

Rondeau, Michael F., James Cassidy, and Terry L. Jones

2007 Colonization Technologies: Fluted Projectile Points and the First Californians. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar. AltaMira Press, Lanham, Maryland.

Sherman Indian Museum

n.d. "Perris Indian School." Electronic document available at: http://www.shermanindianmuseum.org/perris.htm, accessed December 2019.

Shipley, William F.

1978 Native Languages of California. In *California*, edited by Robert F. Heizer, pp. 80-90. Handbook of North American Indians, Vol. 8, William C. Sturtevant, general editor, Smithsonian Institution, Washington, D.C.

Sparkman, Philip Stedman

1908 The Culture of the Luiseño Indians. *University of California Publications in American Archaeology and Ethnology* 8(4):187-234.

State Lands Commission

1982 *Grants of Land in California Made by Spanish or Mexican Authorities*. Boundary Determination Office, State Lands Commission, Boundary Investigation Unit.

Stine, Scott

1994 Extreme and Persistent Drought in California and Patagonia during Mediaeval Time. *Nature* 369:546–549.

Strong, William D.

1929 *Aboriginal Society in Southern California.* University of California Publications in American Archaeology and Ethnology 26(1):1–358. Berkeley.

Sutton, Mark Q., and Jill K. Gardner

2010 Reconceptualizing the Encinitas Tradition of Southern California. *Pacific Coast Archaeological Society Quarterly*, 42(4)1–64.

Sutton, Mark Q., and Donn R. Grenda

2012 Defining Level 1 at Malaga Cove (CA-LAN-138), Alta California. *California Archaeology* 4(1): 123–144.

Sutton, Mark Q., Mark E. Basgall, Jill K. Gardner, and Mark W. Allen
2007 Advances in Understanding Mojave Desert Prehistory. In *California Prehistory: Colonization, Culture, and Complexity*, edited by Terry L. Jones and Kathryn A. Klar, pp. 229–245. Alta Mira Press, Lanham, Maryland.

The Perris Valley Historical & Museum Association
2016 *Images of America: Perris Valley*. Arcadia Publishing. Charleston, South Carolina.

True, D. L.
1990 Site Locations and Water Supply: A Perspective from Northern San Diego County, California. *Journal of New World Archaeology* 7(4):37–60.

True, D. L., and Paul D. Bouey
1990 Gladishill: A Probable San Dieguito Camp Near Valley Center, California. *Journal of New World Archaeology* 7(4): 1-28.

Vaughan, Sheila J.
1982 *A Replicative Systems Analysis of the San Dieguito Component at the C.W. Harris Site.* Master's thesis, Department of Anthropology, University of Nevada, Las Vegas.

Wallace, William J.
1955 Suggested Chronology for Southern California Coastal Archaeology. *Southwestern Journal of Anthropology* 11:214–230.

Warren, Claude N.
1966 *The San Dieguito Type Site: M. J. Rogers' 1938 Excavation on the San Dieguito River*. San Diego Museum Paper No. 6, San Diego, California.

1967 The San Dieguito Complex: A Review and Hypothesis. *American Antiquity* 32(2):168-185.

1968 Cultural Tradition and Ecological Adaptation on the Southern California Coast. In *Archaic Prehistory in the Western United States*, edited by C. Irwin-Williams, pp. 1–14. Eastern New Mexico University Contributions in Anthropology No. 1.

1984 The Desert Region. In *California Archaeology*, edited by Michael J. Moratto, pp. 339–430. Academic Press, Orlando, Florida.

Warren, Claude N., and H. T. Ore
2011 The Age of the San Dieguito Artifact Assemblage at the C. W. Harris Site. *Journal of California and Great Basin Anthropology* 31(1):81-97.

Warren, Claude N., Gretchen Siegler, and Frank Dittmer
1998 Paleo-Indian and Early Archaic Periods. In *Prehistoric and Historic Archaeology of Metropolitan San Diego: A Historic Properties Background Study*. Draft report prepared by ASM Affiliates and submitted to Metropolitan Wastewater, San Diego.

Warren, Claude N., and D. L. True

1961 The San Dieguito Complex and Its Place in San Diego County Prehistory. *Archaeological Survey Annual Report*, 1960-1961, pp. 246-291. University of California, Los Angeles.

Weber, David

1992 *The Spanish Frontier in North America*. Yale University Press.

White, Raymond C.

1963 Luiseño Social Organization. *University of California Publications in American Archaeology and Ethnology* 48(2):91-194.

Wilke, Philip

1974 Settlement and Subsistence at Perris Reservoir: A Summary of Archaeological Investigations. In *Perris Reservoir Archaeology,* edited by James F. O'Connell, Philip J. Wilke, Thomas F. King, and Carol L. Mix, pp. 20–30. California Department of Parks and Recreation Reports No. 14. Sacramento.

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Appendix A

Resumes

Stacie Wilson, MS, RPA

Project Manager

HELIX Environmental Planning

Summary of Qualifications

Ms. Wilson has been professionally involved in CRM for 15 years and has more than 17 years of unique experience in both archaeology and GIS. She has served as principal investigator on numerous cultural resources management projects, and regularly coordinates with local, state, and federal agencies and Native American tribal representatives. She is skilled in project management, archaeological inventories and excavation, and report documentation and has broad experience on private, municipal, federal, utility, and renewable energy projects. Her years of experience also encompass an understanding of CEQA and NEPA compliance regulations. She is proficient at creating, organizing, and analyzing GIS data; her technical skills include ArcGIS 10.4, Spatial Analyst, Geostatistical Analyst, and working with datasets in Microsoft Word and Excel. Ms. Wilson is detail oriented and has strong organizational and coordination capabilities. She has managed large-scale surveys and site evaluations and designed and implemented site mitigation programs throughout southern California.

Selected Project Experience

Apple Valley Airport Detention Basin IS/MND (2017-2018). Project Manager for the preparation of an IS/MND for the acquisition of an approximately 18-acre property at the airport for construction of a detention basin to address stormwater runoff. Work performed for C&S Companies, with San Bernardino County as the lead agency.

Roripaugh Ranch - Phase 2 Project (2018-2018). Principal Investigator for a records search and background research, Native American coordination and contacting the NAHC, field survey, coordination with USACE, and preparation of a report addressing the NHPA Section 106 compliance

Cactus II Feeder Transmission Pipeline IS/MND (2017-2018). Senior Archaeologist overseeing cultural resources survey and report for this proposed pipeline project, including background research and Native American outreach. Assisted EMWD with Native American consultation under AB 52. The project will construct five miles of new transmission pipeline to serve planned development in Moreno Valley. Work performed for EMWD

Southern California Edison (SCE) As-Needed Environmental Compliance Support (2015-2016). Principal Investigator and Field Director for various as-needed projects located within SCE territory throughout several counties. Duties included coordination of cultural records searches, surveys, and reporting efforts for Capital Improvement and Transmission Line Rating Remediation (TLRR) program projects.

Valley South Subtransmission Project (2012- 015). Field Director and report author for a cultural resources inventory of the proposed Valley South Subtransmission Project located in

Education

Master of Science, Applied Geographical Information Science, Northern Arizona University, 2008

Bachelor of Arts, Anthropology, University of California, San Diego, 2001

Bachelor of Science, Biological Psychology, University of California, San Diego, 2001

Registrations/ Certifications

Register of Professional Archaeologists, The Register of Professional Archaeologists #16436, 2008, Riverside County Approved Cultural Resources Consultant, 2017

Professional Affiliations

Society for California Archaeology

western Riverside County. Covering over 20 miles, the Phase I inventory and field survey project included compilation of record searches, a Native American contact program, field surveys, and completion of a Cultural Resources Survey Report and Proponent's Environmental Assessment section. Work performed for SCE, with the California Public Utilities Commission as the lead agency.

Path 42 Transmission Line Project (2012-2013). Field Director for a cultural resources survey of the proposed Path 42 Transmission Line Project in Riverside County. Covering 233 acres, the Class III study included compilation of record searches, a Native American contact program, field surveys, and completion of a cultural resources Class III report. Work performed for Imperial Irrigation District (IID), with BLM as the lead agency.

Antelope Valley Solar Project (2011-2012). Field Director, GIS Specialist, and report author for solar electric-generating facilities proposed on an approximately 5,000-acre site in Kern and Los Angeles counties. The project included the organization of a records search, Native American contact program, archaeological and built environment surveys, the recordation of cultural resources, and the preparation of cultural resources reports. Work performed for Renewable Resources Group, Inc., with the County of Kern as the lead agency.

Bureau of Land Management National Historic Trails Inventory, AZ, CA, CO, NM, NV, UT, WY (2010-2012). GIS Task Lead for a multi-state initiative that focused on identifying, field inventorying, and assessing the cultural and visual resources of six National Historic Trails located on land owned by BLM. The inventory included examining high potential route segments and high potential historic sites of the Old Spanish, El Camino Real de Tierra Adentro, California, Oregon, Mormon Pioneer, and Pony Express National Historic Trails. Task lead duties included technical guidance, development of methodology, establishment of protocols and standards for field work, and reviewing of technical work for the GIS-related tasks.

Mojave Solar Project and Lockhart Substation Connection & Communication Facilities (2010-2011). Project Manager, Field Director, and Class III report author for a cultural resources survey of the Lockhart Substation Connection & Communication Facilities for the proposed Mojave Solar Project. The project was located on private, BLM, and Edwards Air Force Base lands in San Bernardino County and included surveying 85 linear miles in the Mojave Desert region of California. Work performed for Mojave Solar, LLC, with BLM as the lead agency.

Blythe and Palen Solar Power Projects (2009-2014). GIS Analyst and Field Archaeologist for concentrated solar electric-generating facilities proposed on approximately 2,000-acre and 7,000-acre sites. Proposed facilities were to be located on land in eastern Riverside County owned by the BLM. The projects, under a Fast-Track The American Recovery and Reinvestment Act of 2009 funding schedule, will use well-established parabolic trough solar thermal technology to produce electrical power using a steam turbine generator fed from a solar steam generator. Work included extensive resource and project GIS data management. Work performed for Solar Millennium, LCC, with the BLM as the lead agency.

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PALEONTOLOGICAL TECHNICAL STUDY

ENCHANTED HILLS PARK SKATE SPOT PROJECT, CITY OF PERRIS, RIVERSIDE COUNTY, CALIFORNIA

Prepared for: **The City of Perris**
Planning Department
101 N. D St.
Perris, CA 92570

HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

Prepared by: **Paleo Solutions, Inc.**
911 S. Primrose Ave., Unit N
Monrovia, CA 91016

Courtney Richards, M.S. – Principal Investigator
Joey Raum, B.S. – Report Author

PSI Report: CA20RiversideHEL01R

January 2, 2020

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Table of Contents

Figures

Tables

1.0 EXECUTIVE SUMMARY

This report presents the results of the paleontological technical study conducted by Paleo Solutions, Inc. (Paleo Solutions) in support of the Enchanted Hills Park Skate Spot Project (Project) located in the City of Perris in Riverside County, California, within the Peninsular Ranges Geomorphic Province (see Figures 1 and 2). Paleo Solutions was contracted by Helix Environmental Planning, Inc. (Helix) to conduct an analysis of existing paleontological data and to provide recommendations for mitigation based on the geological and paleontological data. This work was required by the City of Perris (the City) to meet their requirements as the lead agency under the California Environmental Quality Act (CEQA). All paleontological work was completed in compliance with CEQA, local guidelines, and best practices in mitigation paleontology (Murphey et al., 2019). The results of the paleontological technical study will be incorporated into the Project's Initial Study/Mitigated Negative Declaration (IS/MND). See Table 1 for a Project summary.

The Project consists of construction of a skate park within the existing Enchanted Hills Park located in the City of Perris. The Project area encompasses approximately 22.2 acres and is bounded by residential properties on all sides. The Project area is mapped on the USGS Peak (2003) and Steele Peak (2001) 7.5' Topographic Quadrangles and is situated entirely on lands with undetermined ownership in the Northwest-Southwest and Northeast-Southwest quarter-quarters, of Section 25, Township 4 South, Range 4 West. Geologic mapping by D.M. Morton, R.M. Alvarez, and V.M. Diep (2002) and D.M. Morton, K.R. Bovard, and R.M. Alvarez (2003) indicates that the Project area is entirely underlain by Cretaceous-age tonalite of Val Verde pluton (Kvt) (see Figure 3). Late to middle Pleistocene-age old alluvial fan deposits, arenaceous (Qofa), is also mapped within the Project vicinity, within a half mile buffer (Morton et al., 2002, 2003; see Figure 3). However, since these sediments are not located at the surface within the Project area boundaries and will also not be encountered within the Project area beneath the Cretaceous-age tonalite of Val Verde pluton (Kvt) due to the stratigraphic relationship of the two geologic units, the late to middle Pleistocene-age old alluvial fan deposits (Qofa) are not discussed in this report.

The Project area was evaluated based on an analysis of existing paleontological data. The three components of the analysis included a geologic map review, a literature search, and two institutional record searches. According to the record searches, there are no previously recorded fossil localities within the Project site; there are no localities recorded within the Project vicinity from geologic units similar to those that occur within the Project area.

Using the analysis of existing data, the geologic unit was evaluated on its potential for producing significant paleontological resources. Paleontological sensitivity assignments were developed following the Potential Fossil Yield Classification (PFYC) system (BLM, 2016) and best practices in mitigation paleontology (Murphey et al., 2019). Cretaceous-age tonalite of Val Verde pluton (Kvt) consists of plutonic rocks, which are formed at high temperatures and pressures not conducive to fossil preservation. Cretaceous-age tonalite of Val Verde pluton (Kvt), therefore, has a very low paleontological potential (PFYC 1).

Due to the very low paleontological potential (PFYC 1) of the Cretaceous-age tonalite of Val Verde pluton (Kvt) that is located throughout the entirety of the Project area, further paleontological mitigation is not recommended.

2.0 INTRODUCTION

This report presents the results of the paleontological technical study conducted by Paleo Solutions in support of the Enchanted Hills Park Skate Spot Project located in the City of Perris in Riverside County, California, within the Peninsular Ranges Geomorphic Province (Figures 1 and 2). Paleo Solutions was contracted by Helix to conduct an analysis of existing paleontological data and to provide recommendations for mitigation based on the geological and paleontological data. This work was required by the City to meet their requirements as the lead agency under CEQA. All paleontological work was completed in compliance with CEQA, local guidelines, and best practices in mitigation paleontology (Murphey et al., 2019). See Table 1 for a Project summary.

2.1 Project Description and Location

The Project consists of construction of a skate park within the existing Enchanted Hills Park located in the City of Perris. The Project area encompasses approximately 22.2 acres and is bounded by residential properties on all sides. The Project area is mapped on the USGS Peak (2003) and Steele Peak (2001) 7.5' Topographic Quadrangles and is situated entirely on lands with undetermined ownership in the Northwest-Southwest and Northeast-Southwest quarter-quarters, of Section 25, Township 4 South, Range 4 West. Geologic mapping by D.M. Morton, R.M. Alvarez, and V.M. Diep (2002) and D.M. Morton, K.R. Bovard, and R.M. Alvarez (2003) indicates that the Project area is entirely underlain by Cretaceous-age tonalite of Val Verde pluton (Kvt) (Figure 3).

Table 1. Enchanted Hills Park Skate Spot Project Summary.

<table>
<tr><td>Project Name</td><td colspan="4">Enchanted Hills Park Skate Spot Project</td></tr>
<tr><td>Project Description</td><td colspan="4">The Project consists of construction of a skate park within the existing Enchanted Hills Park. The Project area is bounded by residential properties on all sides.</td></tr>
<tr><td>Project Area</td><td colspan="4">The Project area is located in the City of Perris, Riverside County, California.</td></tr>
<tr><td rowspan="2">Location (PLSS)</td><td>Quarter-Quarter</td><td>Section</td><td>Township</td><td>Range</td></tr>
<tr><td>NWSW, NESW</td><td>Sec. 25</td><td>T4S</td><td>R4W</td></tr>
<tr><td rowspan="2">Land Owner</td><td>Surface Management Agency</td><td colspan="3">Acres</td></tr>
<tr><td>Undetermined</td><td colspan="3">22.2 acres</td></tr>
<tr><td>Topographic Map(s)</td><td colspan="4">USGS Peak (2003) and Steele Peak (2001) 7.5' Topographic Quadrangles</td></tr>
<tr><td>Geologic Map(s)</td><td colspan="4">Geologic Map of the Steele Peak 7.5' Quadrangle, Riverside County, California (Morton et al., 2002)
Preliminary Geologic Map of the Perris 7.5' Quadrangle, Riverside County, California (Morton et al., 2003)</td></tr>
<tr><td rowspan="3">Mapped Geologic Unit(s) and age(s)</td><td>Geologic Unit and Map Symbol</td><td colspan="2">Age</td><td>Paleontological Potential (PFYC)</td></tr>
<tr><td>Old alluvial fan deposits, arenaceous (Qofa)</td><td colspan="2">Late to middle Pleistocene</td><td>3 (Moderate)</td></tr>
<tr><td>Tonalite of Val Verde pluton (Kvt)</td><td colspan="2">Cretaceous</td><td>1 (Very Low)</td></tr>
<tr><td>Previously Documented Fossil Localities within the Project area</td><td colspan="4">Record searches were requested from the Natural History Museum of Los Angeles County (LACM) and the Western Science Center (WSC) located in Riverside County, California. The LACM and WSC record searches yielded no fossil localities recorded within the Project area (see Section 6.2; Appendix A).</td></tr>
<tr><td>Recommendation(s)</td><td colspan="4">Due to the very low paleontological potential (PFYC 1) of the Cretaceous-age tonalite of Val Verde pluton (Kvt) that is located throughout the entirety of the Project area, further paleontological mitigation is not recommended.</td></tr>
</table>

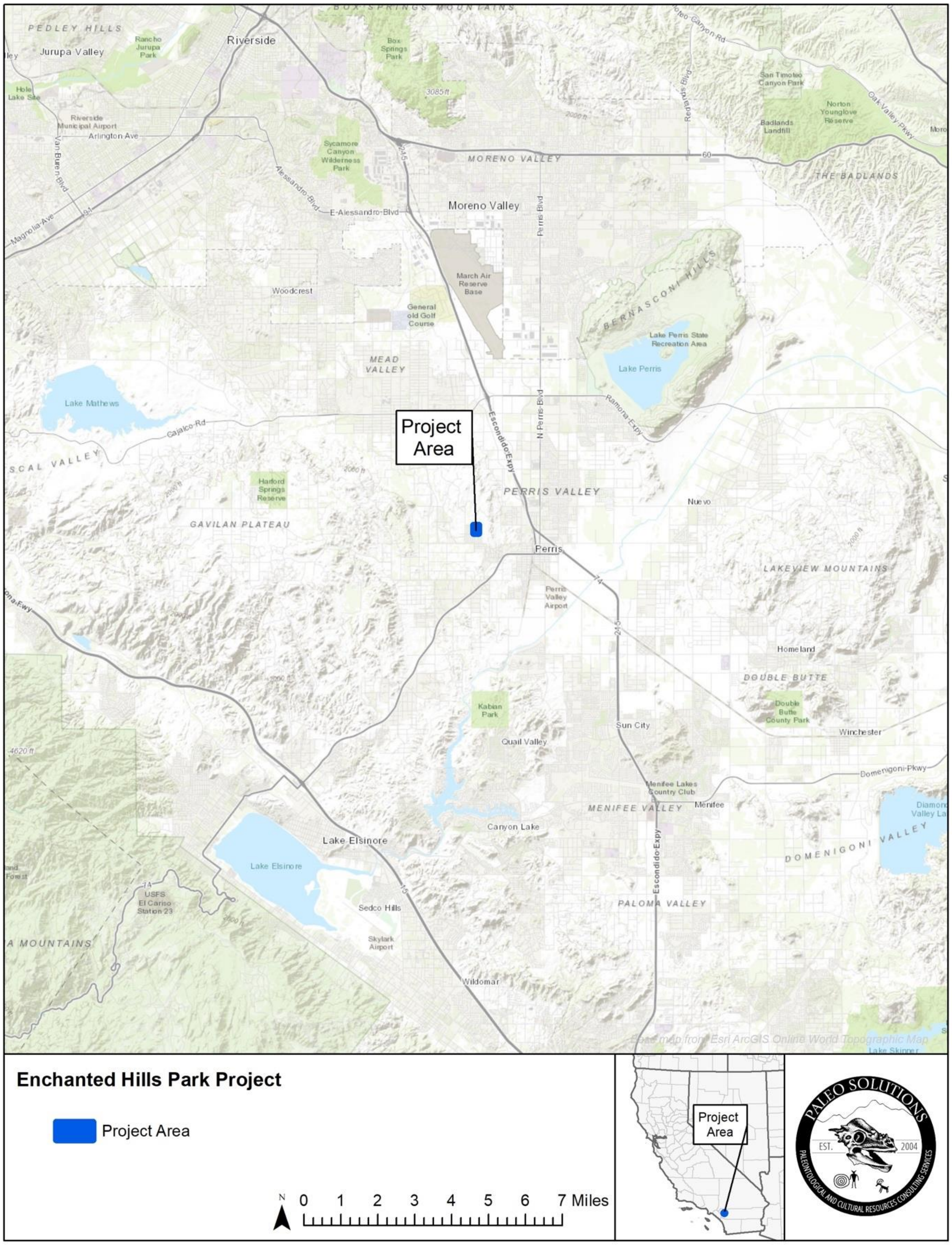

Figure 1. Project Location Map.

Figure 2. Project Overview Map.

3.0 DEFINITION AND SIGNIFICANCE OF PALEONTOLOGICAL RESOURCES

As defined by Murphey and Daitch (2007): "Paleontology is a multidisciplinary science that combines elements of geology, biology, chemistry, and physics in an effort to understand the history of life on earth. Paleontological resources, or fossils, are the remains, imprints, or traces of once-living organisms preserved in rocks and sediments. These include mineralized, partially mineralized, or unmineralized bones and teeth, soft tissues, shells, wood, leaf impressions, footprints, burrows, and microscopic remains. Paleontological resources include not only fossils themselves, but also the associated rocks or organic matter and the physical characteristics of the fossils' associated sedimentary matrix.

The fossil record is the only evidence that life on earth has existed for more than 3.6 billion years. Fossils are considered non-renewable resources because the organisms they represent no longer exist. Thus, once destroyed, a fossil can never be replaced. Fossils are important scientific and educational resources because they are used to:

- Study the phylogenetic relationships amongst extinct organisms, as well as their relationships to modern groups;
- Elucidate the taphonomic, behavioral, temporal, and diagenetic pathways responsible for fossil preservation, including the biases inherent in the fossil record;
- Reconstruct ancient environments, climate change, and paleoecological relationships;
- Provide a measure of relative geologic dating that forms the basis for biochronology and biostratigraphy, and which is an independent and corroborating line of evidence for isotopic dating;
- Study the geographic distribution of organisms and tectonic movements of land masses and ocean basins through time;
- Study patterns and processes of evolution, extinction, and speciation; and
- Identify past and potential future human-caused effects to global environments and climates."

Fossil resources vary widely in their relative abundance and distribution and not all are regarded as significant. According to the BLM Instructional Memorandum (IM) 2009-011, a "Significant Paleontological Resource" is defined as:

> "Any paleontological resource that is considered to be of scientific interest, including most vertebrate fossil remains and traces, and certain rare or unusual invertebrate and plant fossils. A significant paleontological resource is considered to be of scientific interest if it is a rare or previously unknown species, it is of high quality and well-preserved, it preserves a previously unknown anatomical or other characteristic, provides new information about the history of life on earth, or has an identified educational or recreational value. Paleontological resources that may be considered not to have scientific significance include those that lack provenience or context, lack physical integrity due to decay or natural erosion, or that are overly redundant or are otherwise not useful for research. Vertebrate fossil remains and traces include bone, scales, scutes, skin impressions, burrows, tracks, tail drag marks, vertebrate coprolites (feces), gastroliths (stomach stones), or other physical evidence of past vertebrate life or activities" (BLM, 2008)."

Vertebrate fossils, whether preserved remains or track ways, are classified as significant by most state and federal agencies and professional groups (and are specifically protected under the California Public Resources Code). In some cases, fossils of plants or invertebrate animals are also considered significant and can provide important information about ancient local environments.

The full significance of fossil specimens or fossil assemblages cannot be accurately predicted before they are collected, and in many cases, before they are prepared in the laboratory and compared with previously collected fossils. Pre-construction assessment of significance associated with an area or formation must be made based on previous finds, characteristics of the sediments, and other methods that can be used to determine paleoenvironmental and taphonomic conditions.

4.0 LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

This section of the report presents the state and local regulatory requirements pertaining to paleontological resources that will apply to this Project.

4.1 State Regulatory Setting

4.1.1 California Environmental Quality Act (CEQA)

The procedures, types of activities, persons, and public agencies required to comply with CEQA are defined in the Guidelines for Implementation of CEQA (State CEQA Guidelines), as amended on March 18, 2010 (Title 14, Section 15000 et seq. of the California Code of Regulations) and further amended January 4, 2013 and again December 28, 2018. One of the questions listed in the CEQA Environmental Checklist is: "Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?" (State CEQA Guidelines Appendix G, Section VII, Part F).

4.1.2 State of California Public Resource Code

The State of California Public Resources Code (Chapter 1.7), Sections 5097 and 30244, includes additional state level requirements for the assessment and management of paleontological resources. These statutes require reasonable mitigation of adverse impacts to paleontological resources resulting from development on state lands, and define the excavation, destruction, or removal of paleontological "sites" or "features" from public lands without the express permission of the jurisdictional agency as a misdemeanor. As used in Section 5097, "state lands" refers to lands owned by, or under the jurisdiction of, the state or any state agency. "Public lands" is defined as lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.

4.2 Local Regulatory Setting

4.2.1 Riverside County

The Riverside County General Plan requires consideration of paleontological resources under the Multipurpose Open Space Element of the general plan (County of Riverside, 2015). The Riverside County General Plan recommendations are based on the Society of Vertebrate Paleontology (SVP) guidelines (SVP, 2010) for the mitigation of paleontological resources. The Multipurpose Open Space Element of the general plan (County of Riverside, 2015) provides the following requirements for paleontological sensitive areas within the county:

- OS 19.6 Whenever existing information indicates that a site proposed for development has high paleontological sensitivity as shown on Figure OS-8, a paleontological resource impact mitigation program (PRIMP) shall be filed with the County Geologist prior to site grading. The PRIMP shall specify the steps to be taken to mitigate impacts to paleontological resources.

- OS 19.7 Whenever existing information indicates that a site proposed for development has low paleontological sensitivity as shown on Figure OS-8, no direct mitigation is required unless a fossil is encountered during site development. Should a fossil be encountered, the County Geologist shall be notified, and a paleontologist shall be retained by the project proponent. The paleontologist shall document the extent and potential significance of the paleontological resources on the site and establish appropriate mitigation measures for further site development.

- OS 19.8 Whenever existing information indicates that a site proposed for development has undetermined paleontological sensitivity as shown on Figure OS-8, a report shall be filed with the County Geologist documenting the extent and potential significance of the paleontological resources on site and identifying mitigation measures for the fossil and for impacts to significant paleontological resources prior to approval of that department.

- OS 19.9 Whenever paleontological resources are found, the County Geologist shall direct them to a facility within Riverside County for their curation, including the Western Science Center in the City of Hemet.

4.2.2 City of Perris

The City of Perris General Plan (2005) has one goal, one policy, and three implementation measures relating to paleontological resources. Goal 4 requires the protection of historical, archaeological and paleontological sites. Policy IV.A requires that the City of Perris comply with state and federal regulations and ensure preservation of the significant historical, archaeological and paleontological resources within the City. The three implementation measures require that all new construction involving grading require appropriate surveys and necessary site investigations in conjunction with the earliest environmental documents prepared for a project, that in specifically delineated areas shown on the City's paleontological sensitivity map that levels of paleontological monitoring will be required, from full-time monitoring to part-time monitoring in some less-sensitive areas. Finally, the General Plan requires that the City of Perris identify and collect previous surveys of cultural resources, evaluate each resource and consider preparation of a comprehensive citywide inventory of cultural resources including both prehistoric sites and man-made resources.

5.0 METHODS

The paleontological analysis of existing data included a geologic map review, a literature search, and a review of the LACM and WSC record searches. The goal of this report is to identify the paleontological potential of the Project area and make recommendations for the mitigation of adverse impacts on paleontological resources that may occur as a result of the proposed construction. Paleontological sensitivity assignments were determined using the PFYC system (BLM, 2016) and best practices in mitigation paleontology (Murphey et al., 2019). Joey Raum, B.S., completed the background research and authored this report. Courtney Richards, M.S., performed the technical review of this report. GIS maps were prepared by Barbara Webster, M.S. Geraldine Aron, M.S., and Courtney Richards, M.S., oversaw all aspects of the Project as the Project Manager and Paleontological Principal Investigator, respectively.

Copies of this report will be submitted to be the City and Helix and will be incorporated into the Project's IS/MND. Paleo Solutions will retain an archival copy of all project information including maps and other data.

5.1 Analysis of Existing Data

Paleo Solutions reviewed geologic mapping of the Project area and half-mile buffer by D.M. Morton, R.M. Alvarez, and V.M. Diep (2002) and D.M. Morton, K.R. Bovard, and R.M. Alvarez (2003). The literature reviewed included published and unpublished scientific papers. Paleontological museum record searches were conducted at the LACM and WSC. Samuel McLeod, Ph.D., conducted the LACM search (December 13, 2019), and Darla Radford, M.S., conducted the WSC search (December 12, 2019). The results of two museum record searches are provided as Appendix A.

5.2 Criteria for Evaluating Paleontological Potential

The PFYC system was developed by the BLM (BLM, 2016). Because of its demonstrated usefulness as a resource management tool, the PFYC has been utilized for many years for projects across the country, regardless of land ownership. It is a predictive resource management tool that classifies geologic units on their likelihood to contain paleontological resources on a scale of 1 (very low potential) to 5 (very high potential). This system is intended to aid in predicting, assessing, and mitigating paleontological resources. The PFYC ranking system is summarized in Table 2, along with the Riverside County guidelines paleontological sensitivity rankings, which are included for a comparison of the two systems.

Table 2. Summary of Comparison between PFYC System and Riverside County Paleontological Sensitivity Rankings.

BLM PFYC Designation	*Riverside County Paleontological Sensitivity	Assignment Criteria Guidelines and Management Summary (PFYC system)
1 = Very Low Potential	Low Sensitivity	Geologic units are not likely to contain recognizable paleontological resources.
		Units are igneous or metamorphic, excluding air-fall and reworked volcanic ash units.
		Units are Precambrian in age.
		Management concern is usually negligible, and impact mitigation is unnecessary except in rare or isolated circumstances.
2 = Low Potential**	High B Sensitivity	Geologic units are not likely to contain paleontological resources.
		Field surveys have verified that significant paleontological resources are not present or are very rare.
		Units are generally younger than 10,000 years before present.
		Recent aeolian deposits.
		Sediments exhibit significant physical and chemical changes (i.e., diagenetic alteration) that make fossil preservation unlikely.
		Management concern is generally low, and impact mitigation is usually unnecessary except in occasional or isolated circumstances.
3 = Moderate Potential	High A Sensitivity	Sedimentary geologic units where fossil content varies in significance, abundance, and predictable occurrence.
		Marine in origin with sporadic known occurrences of paleontological resources.
		Paleontological resources may occur intermittently, but these occurrences are widely scattered.
		The potential for authorized land use to impact a significant paleontological resource is known to be low-to-moderate.

BLM PFYC Designation	*Riverside County Paleontological Sensitivity	Assignment Criteria Guidelines and Management Summary (PFYC system)
		Management concerns are moderate. Management options could include record searches, pre-disturbance surveys, monitoring, mitigation, or avoidance. Opportunities may exist for hobby collecting. Surface-disturbing activities may require sufficient assessment to determine whether significant paleontological resources occur in the area of a proposed action and whether the action could affect the paleontological resources.
4 = High Potential	High A Sensitivity	Geologic units that are known to contain a high occurrence of paleontological resources.
		Significant paleontological resources have been documented but may vary in occurrence and predictability.
		Surface-disturbing activities may adversely affect paleontological resources.
		Rare or uncommon fossils, including nonvertebrate (such as soft body preservation) or unusual plant fossils, may be present.
		Illegal collecting activities may impact some areas.
		Management concern is moderate to high depending on the proposed action. A field survey by a qualified paleontologist is often needed to assess local conditions. On-site monitoring or spot-checking may be necessary during land disturbing activities. Avoidance of known paleontological resources may be necessary.
5 = Very High Potential	High A Sensitivity	Highly fossiliferous geologic units that consistently and predictably produce significant paleontological resources.
		Significant paleontological resources have been documented and occur consistently.
		Paleontological resources are highly susceptible to adverse impacts from surface disturbing activities.
		Unit is frequently the focus of illegal collecting activities.
		Management concern is high to very high. A field survey by a qualified paleontologist is almost always needed and on-site monitoring may be necessary during land use activities. Avoidance or resource preservation through controlled access, designation of areas of avoidance, or special management designations should be considered.
U = Unknown Potential	Undetermined Sensitivity	Geologic units that cannot receive an informed PFYC assignment
		Geological units may exhibit features or preservational conditions that suggest significant paleontological resources could be present, but little information about the actual paleontological resources of the unit or area is unknown.
		Geologic units represented on a map are based on lithologic character or basis of origin but have not been studied in detail.
		Scientific literature does not exist or does not reveal the nature of paleontological resources.
		Reports of paleontological resources are anecdotal or have not been verified.
		Area or geologic unit is poorly or under-studied.
		BLM staff has not yet been able to assess the nature of the geologic unit.
		Until a provisional assignment is made, geologic units with unknown potential have medium to high management concerns. Field surveys are normally necessary, especially prior to authorizing a ground-disturbing activity.

*Riverside County guidelines paleontological sensitivity rankings comparison to BLM PFYC rankings. This comparison does not denote an absolute correlation between the rankings.
**Sensitivity may increase with depth.

6.0 ANALYSIS OF EXISTING DATA

The Project area is located within the Peninsular Ranges Geomorphic Province (Harden, 2004). A geomorphic province is a geographical area of distinct landscape character, with related geophysical features, including relief, landforms, orientations of valleys and mountains, type of vegetation, and other geomorphic attributes (Harden, 2004). Attributes of the Peninsular Ranges Geomorphic Province consist of northwest-southeast-trending, fault-bounded discrete blocks, with mountain ranges, broad intervening valleys, and low-lying coast plains (Yerkes et al., 1965; Norris and Webb, 1990). Within California, the province extends approximately 125 miles from the Transverse Ranges and the Los Angeles Basin south to the Mexican border, extending southward approximately 775 miles toward to the tip of Baja California, and it is bound on the east by the right-slip San Andreas Fault Zone, the Eastern Transverse Ranges, and the Colorado Desert (Norris and Webb, 1990; Hall, 2007). Most of the geomorphic province is located offshore and includes the Santa Catalina and San Clemente islands (Hall, 2007). Topographically on the mainland, the Peninsular Ranges are steeper on the eastern slopes, where they are truncated by normal faults like the Elsinore or San Jacinto faults, and are more gradual on their western slopes toward the Pacific Ocean, similar to the topography of the Sierra Nevada (Norris and Webb, 1990; Prothero, 2017). Within the province, the highest elevations are found in the eastern-most block, with San Jacinto Peak reaching approximately 10,805 feet in elevation and various summits of the Santa Rosa Mountains averaging 6,000 feet in elevation (Norris and Webb, 1990). Westward toward the coast, elevations are less dramatic.

The pre-Phanerozoic history of the Peninsular Ranges is not represented within the province, and few locations contain rocks older than the Mesozoic (Norris and Webb, 1990), and sparse Paleozoic strata within the Peninsular Ranges is in stark contrast to the Sierra Nevada, which contains thick sections of Paleozoic rocks. The oldest pre-batholithic rocks in the Peninsular Ranges are Paleozoic in age and consist of metamorphosed remnants of a stable carbonate platform (now marble and schist) on a passive continental margin that existed along western North America at that time (Harden, 2004). Moreover, late Paleozoic limestone is present near Riverside (Norris and Webb, 1990), further supporting the presence of a shallow marine environment prior to the Mesozoic. Most of the geologic history of the Peninsular Ranges is represented by Mesozoic-age plutonic rocks and Cenozoic-age uplift, erosion, and sedimentary deposition in basins (Sylvester and O'Black Gans, 2016).

During the Triassic and Jurassic, marine sedimentary rocks composed of sandstone and shale were deposited in turbidite sequences along a submarine fan (Harden, 2004). Throughout the Jurassic and Cretaceous, the continental margin became active as the Farallon Plate, which ferried old island arcs, subducted beneath the North American Plate, creating a large pluton complex (i.e., batholith) beneath the surface that rose into the upper crust and intruded into Paleozoic and Mesozoic sedimentary and volcanic rocks (Harden, 2004; Sylvester and O'Black Gans, 2016). The large complex of batholiths resulted in the formation of the San Marcos Gabbro, Bonsall Tonalite, and Woodson Mountain Granodiorite among others in the Peninsular Ranges (Norris and Webb, 1990). Contact metamorphism from the plutons metamorphosed older sedimentary and volcanic rocks into marble, slate, schist, quartzite, gneiss, and metavolcanic rocks (Sylvester and O'Black Gans, 2016). The timing of the Peninsular Ranges Batholith is similar to that of the Sierra Nevada, ranging in age from 70 to 120 million years ago (Norris and Webb, 1990). The batholith complex originally formed south of the Mexican border but has since moved along the right-slip San Andreas Fault over the past 40 million years (Prothero, 2017). During the Late Cretaceous through the Paleogene, the Peninsular Ranges Batholith was uplifted and eroded into a broad plain, where fluvial systems transported sediments westward across the plain and onto the seafloor (Sylvester and O'Black Gans, 2016). Sedimentary rocks were deposited in a forearc basin by turbidity currents representing both deep and shallow marine and nonmarine environments, including the marine Williams, Ladd, and Rosario formations and the nonmarine Trabuco Formation, with extensive exposures in the western flank of the Santa Ana Mountains (Norris and Webb, 1990; Harden, 2004).

Throughout the Cenozoic, thick sections of sedimentary rocks were deposited in large basins, such as the Los Angeles, Imperial, and offshore basins, due to erosion (Norris and Webb, 1990). Most exposures of early Tertiary strata are restricted to the coastal margins, with a maximum thickness of approximately 4,500 feet in the Santa Ana Mountains (Norris and Webb, 1990). Most Cenozoic strata represent nonmarine depositional environments; however, approximately 600 feet of marine sediments are present near San Diego (Norris and Webb, 1990). Thick nonmarine deposits formed during the Oligocene, followed by a pause of sedimentation at the end of the Oligocene due to tectonic uplift (Norris and Webb, 1990). By the beginning of the Miocene, most of the Farallon Plate had been subducted beneath the North American Plate, and the Pacific Plate came into contact with the North American Plate (Sylvester and O'Black Gans, 2016). As the Pacific Plate slid northwest along the North American Plate, a section of forearc basin was rafted, rotated clockwise approximately 110 degrees, and carried north approximately 130 miles; while carried northward, the forearc basin was compressed and formed the Transverse Ranges located immediately north of the Peninsular Ranges (Sylvester and O'Black Gans, 2016). Additionally, movement along the San Jacinto Fault Zone, which bifurcates from the San Andreas Fault Zone in an area north of the Peninsular Ranges, occurred in the middle to late Tertiary through the Quaternary, with a right-slip and vertical motion resulting in approximately 18 miles of lateral displacement (Norris and Webb, 1990). During this time, thick accumulations of nonmarine sediments filled basins, as well as coastal and offshore areas, in the northern Peninsular Ranges during the Pliocene, with up to 7,000-foot thick sections of siltstone, sandstone, and conglomerate in the Mount Eden and San Timoteo canyons (Norris and Webb, 1990). Despite widespread volcanism elsewhere in southern California during the late Tertiary, little volcanism occurred within the Peninsular Ranges during this time (Norris and Webb, 1990). Throughout the Quaternary, fluvial and lacustrine sediments continued to fill basins within the province, with restricted volcanic and marine terrace deposits along the coast (Norris and Webb, 1990).

The Project area is situated in the Perris Block, which is a fault-bounded block comprising part of the northern Peninsular Ranges. The block lies between the Los Angeles Basin and the San Jacinto Mountains and is bounded by the San Jacinto and Elsinore-Chino Fault zones and the Cucamonga Fault (Woodford et al., 1971). During the Pliocene and Pleistocene, deep isostatic flow caused the Perris Block to oscillate vertically as the Los Angeles Basin sank and the San Jacinto Mountains rose (Woodford et al., 1971). The oscillations resulted in deposition of deep valley continental sediments as well as volcanic rocks, which were emplaced on top of the dominantly crystalline basement, and multiple erosional surfaces (Woodford et al., 1971).

6.1 Geologic Map and Literature Review

Geologic mapping by D.M. Morton, R.M. Alvarez, and V.M. Diep (2002) and D.M. Morton, K.R. Bovard, and R.M. Alvarez (2003) indicates that the Project area is entirely underlain by Cretaceous-age tonalite of Val Verde pluton (Kvt) (Figure 3). Late to middle Pleistocene-age old alluvial fan deposits, arenaceous (Qofa), is also mapped within the Project vicinity, within a half mile buffer (Morton et al., 2002, 2003; see Figure 3). However, since these sediments are not located at the surface within the Project area boundaries and will also not be encountered within the Project area beneath the Cretaceous-age tonalite of Val Verde pluton (Kvt) due to the stratigraphic relationship of the two geologic units, the late to middle Pleistocene-age old alluvial fan deposits (Qofa) are not discussed in this report.

6.1.1 Tonalite of Val Verde Pluton (Kvt) (Cretaceous)

Cretaceous-age tonalite of Val Verde pluton (Kvt) is mapped at the surface of the entire Project area (Morton et al., 2002; 2003; Figure 3). Plutonic rocks formed deep within the Earth's surface at high temperatures and high pressures and lack fossil resources. Cretaceous-age tonalite of Val Verde pluton (Kvt) is therefore considered to have very low paleontological potential (PFYC 1) using BLM (2016) guidelines.

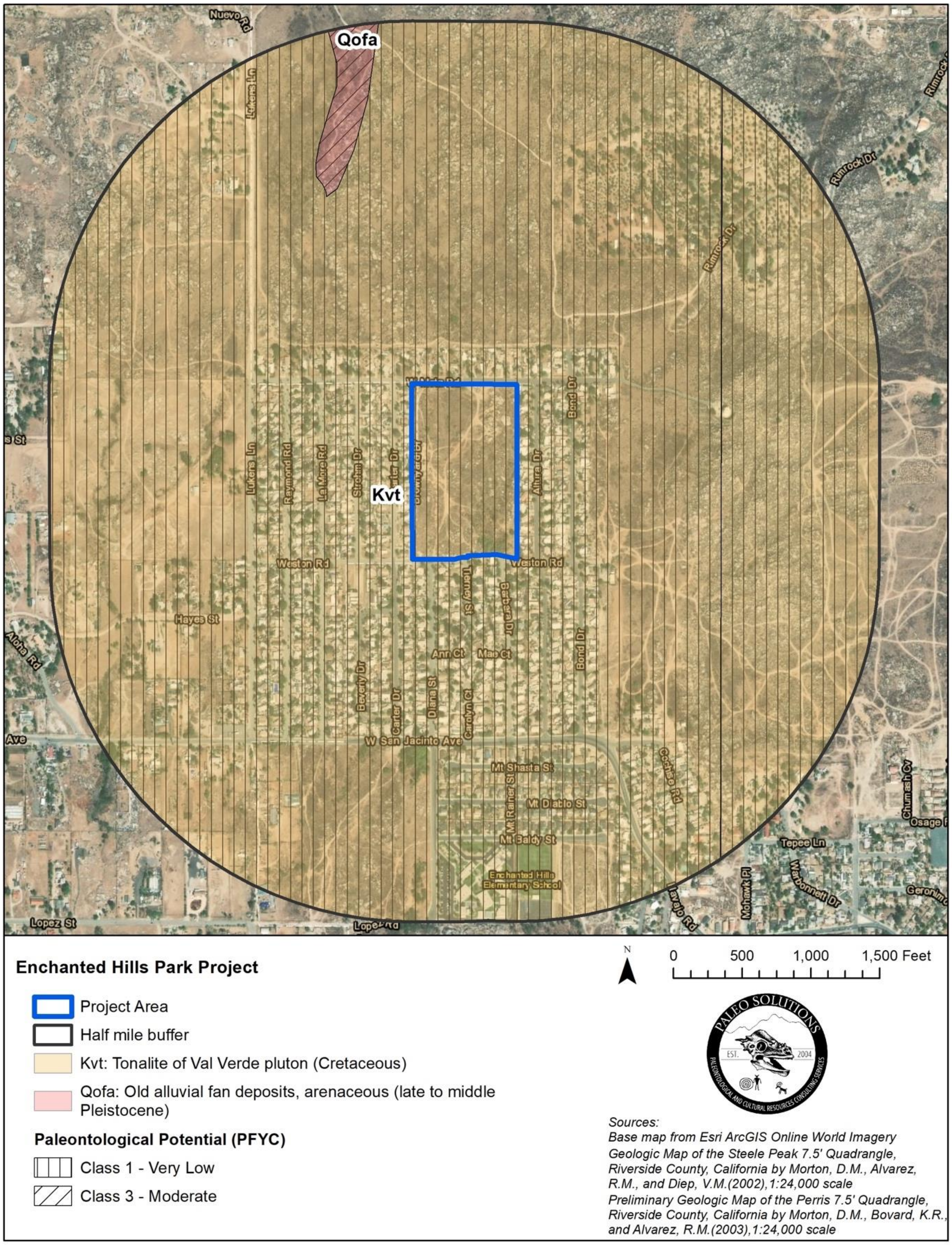

Figure 3. Project Geology Map.

6.2 Paleontological Record Search Results

Paleo Solutions requested paleontological searches of records maintained by the LACM and the WSC. The museums responded on December 13, 2019 and December 12, 2019, respectively, that no vertebrate fossil localities recorded from within the Project area (McLeod, 2019; Radford, 2019). Additionally, there are no localities recorded within the Project vicinity from geologic units similar to those that occur within the Project area.

7.0 IMPACT TO PALEONTOLOGICAL RESOURCES

Impacts on paleontological resources can generally be classified as either direct, indirect, or cumulative. Direct adverse impacts on surface or subsurface paleontological resources are the result of destruction by breakage and crushing as the result of surface disturbing actions including construction excavations. In areas that contain paleontologically sensitive geologic units, ground disturbance has the potential to adversely impact surface and subsurface paleontological resources of scientific importance. Without mitigation, these fossils and the paleontological data they could provide if properly recovered and documented, could be adversely impacted (damaged or destroyed), rendering them permanently unavailable to science and society.

Indirect impacts typically include those effects which result from the continuing implementation of management decisions and resulting activities, including normal ongoing operations of facilities constructed within a given project area. They also occur as the result of the construction of new roads and trails in areas that were previously less accessible. This increases public access and therefore increases the likelihood of the loss of paleontological resources through vandalism and unlawful collecting. Human activities that increase erosion also cause indirect impacts to surface and subsurface fossils as the result of exposure, transport, weathering, and reburial.

Cumulative impacts can result from incrementally minor but collectively significant actions taking place over a period of time. The incremental loss of paleontological resources over time as a result of construction-related surface disturbance or vandalism and unlawful collection would represent a significant cumulative adverse impact, because it would result in the destruction of non-renewable paleontological resources and the associated irretrievable loss of scientific information.

Plutonic rocks, such as the tonalite of Val Verde pluton (Kvt) of the Project area, formed deep within the Earth's surface at high temperatures and high pressures and lack fossil resources. Therefore, Project construction and operation are not anticipated to result in any direct, indirect, or cumulative impacts on paleontological resources.

8.0 CONCLUSIONS AND RECOMMENDATIONS

Due to the very low paleontological potential (PFYC 1) of the Cretaceous-age tonalite of Val Verde pluton (Kvt) that is located throughout the entirety of the Project area at both the surface and at depth, further paleontological mitigation is not recommended.

REFERENCES

Bureau of Land Management (BLM). 2008. Assessment and Mitigation of Potential Impacts to Paleontological Resources: BLM Instruction Memorandum No. 2009-011.

Bureau of Land Management (BLM). 2016. Potential Fossil Yield Classification system: BLM Instruction Memorandum No. 2016-124 (PFYC revised from USFS, 2008).

City of Perris. 2005. City of Perris General Plan, available at: http://www.cityofperris.org/city-hall/general-plan.html

Hall, C.A. 2007. Introduction to the Geology of Southern California and its Native Plants. University of California Press. Berkeley. Pp. 101-149.

Harden, D.R. 2004. California Geology, 2nd Edition: Pearson Prentice Hall. Upper Saddle River. Pp. 464-479.

McLeod, S.A. 2019. Paleontological Resources for the Proposed Enchanted Hills Park Project in the City of Perris, Riverside County, Project area. Natural History Museum of Los Angeles County. Dated December 13, 2019.

Morton, D.M., R.M. Alvarez, and V.M. Diep. 2002. Geologic Map of the Steele Peak 7.5' Quadrangle, Riverside County, California. Scale 1:24,000.

Morton, D.M., K.R. Bovard, and R.M. Alvarez. 2003. Preliminary Geologic Map of the Perris 7.5' Quadrangle, Riverside County, California. Scale 1:24,000.

Murphey, P.C., and D. Daitch. 2007. Paleontological overview of oil shale and tar sands areas in Colorado, Utah and Wyoming: U.S. Department of Energy, Argonne National Laboratory Report Prepared for the U.S. Department of Interior Bureau of Land Management, 468 p., 6 maps, scale 1:500,000.

Murphey, P.C., G.E. Knauss, L.H. Fisk, T.A. Deméré, and R.E. Reynolds. 2019. Best practices in mitigation paleontology: Proceedings of the San Diego Society of Natural History, No. 47.

Norris, R.M. and R.W. Webb. 1990. Geology of California, 2nd Edition: John Wiley and Sons, Inc. New York. Pp. 277-299.

Prothero, D.R. 2017. California's Amazing Geology: CRC Press. Boca Raton. Pp. 295-319.

Radford, D. 2019. Paleontological Records Search Results for the Enchanted Hills Park Project in the City of Perris, Riverside County, California. Western Science Center. Dated December 12, 2019.

Riverside County. 2015. Riverside County General Plan, available at: https://planning.rctlma.org/General-Plan-Zoning/General-Plan

Sylvester, A.G., and E. O'Black Gans. 2016. Roadside Geology of Southern California. Mountain Press Publishing Company. Missoula. Pp. 153-199.

Woodford, A.O., J.S. Shelton, D.O. Doehring, and R.K. Morton. 1971. Pliocene-Pleistocene history of the Perris Block, Southern California. Geological Society of America Bulletin, v. 82, 3421-3448 p.

Yerkes, R.F., T.H. McCulloh, J.E. Schoellhamer, and J.G. Vedder. 1965. Geology of the Los Angeles Basin, California: An Introduction: Professional Paper.

APPENDIX A

Museum Paleontological Record Search Results

Natural History Museum
of Los Angeles County
900 Exposition Boulevard
Los Angeles, CA 90007

tel 213.763.DINO
www.nhm.org

NATURAL HISTORY MUSEUM LOS ANGELES COUNTY

Vertebrate Paleontology Section
Telephone: (213) 763-3325

e-mail: smcleod@nhm.org

13 December 2019

Paleo Solutions, Inc.
911 South Primrose Avenue, Unit N
Monrovia, CA 91016

Attn: Barbara Webster, GIS Specialist & Archaeologist

re: Paleontological resources for the proposed Enchanted Hills Park Project, in the City of Perris, Riverside County, project area

Dear Barbara:

I have conducted a thorough search of our paleontology collection records for the locality and specimen data for the proposed Enchanted Hills Park Project, in the City of Perris, Riverside County, project area as outlined on the portion of the Steele Peak USGS topographic quadrangle map that you sent to me via e-mail on 9 December 2019. We do not have any fossil localities that lie directly within the proposed project area boundaries, nor do we have any fossil localities from the types of rocks that occur in the proposed project area.

Geologic mapping shows that the entire proposed project area has bedrock composed of plutonic igneous rocks that will not contain recognizable fossils. We have no vertebrate fossil localities from these types of rocks. Because the entire proposed project area has exposures and bedrock composed exclusively of igneous rocks, any excavations in the proposed project area will not encounter any recognizable fossils. No paleontological mitigation measures, therefore, are warranted or recommended.

This records search covers only the vertebrate paleontology records of the Natural History Museum of Los Angeles County. It is not intended to be a thorough paleontological survey of the proposed project area covering other institutional records, a literature survey, or any potential on-site survey.

Sincerely,

Samuel A. McLeod

Samuel A. McLeod, Ph.D.
Vertebrate Paleontology

enclosure: invoice

WESTERN SCIENCE CENTER

December 12, 2019

Paleo Solutions
Barbara Webster, MS
911 S. Primrose Ave., Unit N
Monrovia, CA 91016

Dear Ms. Webster,

This letter presents the results of a record search conducted for the Enchanted Hills Park Project in the city of Perris, Riverside County, California. The project site is located north of Weston Road, south of West Metz Road and east of Carter Drive, in Section 25, Township 4 South, and Range 4 West on the Steele Peak USGS 7.5 minute quadrangle.

The geologic units underlying the project area are mapped entirely as Val Verde tonalite deposits dating from the Cretaceous period (Morton, 1996). Tonalite units are considered to be of low paleontological value, and the Western Science Center does not have localities within the project area or within a 1 mile radius.

Should excavation activity associated with the development of the project area extend beyond the current project area into nearby alluvial units, paleontological resources would be possible. However, under current project parameters, and with the geologic units described, it would be unlikely for fossil material to be preserved.

If you have any questions, or would like further information, please feel free to contact me at dradford@westerncentermuseum.org

Sincerely,

Darla Radford
Collections Manager

2345 Searl Parkway ♦ Hemet, CA 92543 ♦ phone 951.791.0033 ♦ fax 951.791.0032 ♦ WesternScienceCenter.org

Appendix D

Hydrology Reports

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100% Submittal
Enchanted Hills Park Drainage Study

Perris, California

Prepared January 10, 2020

Prepared By:
CValdo Corporation

REGISTERED PROFESSIONAL ENGINEER
KEN HORSLEY
NO. 39617
CIVIL
STATE OF CALIFORNIA

Ken Horsley

2255 Avenida De La Playa, Suite 5
La Jolla, CA 92037

Ken Horsley, PE

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Purpose of Study

This study presents the preliminary hydrology analysis for the Enchanted Hills Park, at planning level detail. The project is located in the City of Perris, California (see Figure 1 - Vicinity Map below). The approximate boundaries of the project are West Metz Rd. to the north, Carter Dr. to the west, Altura Dr. to the east and Weston Rd. to the south. The total site area is approximately 22.7 acres. The purpose of the study is to determine the offsite developed condition flow rates for the 10 year and 100 year storm events. Onsite analysis will include both existing and developed condition flow rates for the 10 year and 100 year storm events. Peak flow rates are calculated at the points of run-on at the north and east property lines, and at the 2 points of discharge at the southerly property line (see Figure 2 – Preliminary Site Plan below). Major flow paths and corresponding flow rates are identified on site hydrologic work maps.

Figure 1 - Vicinity Map

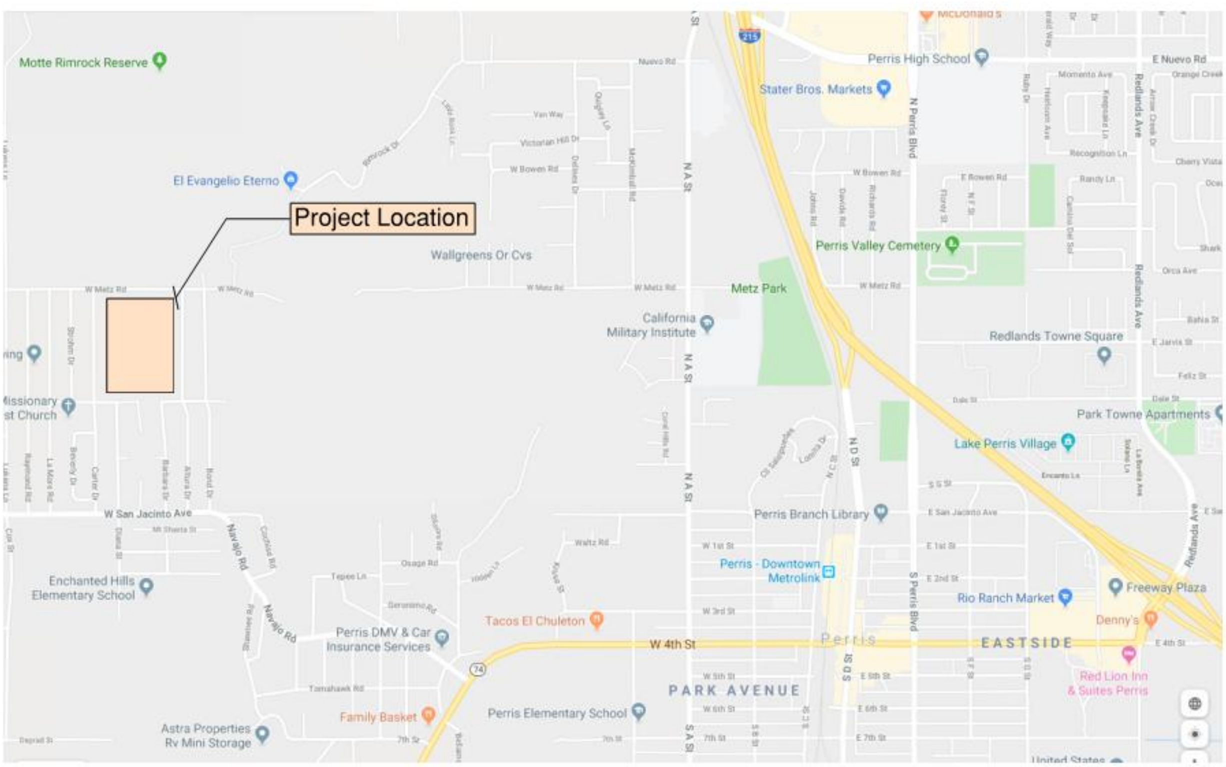
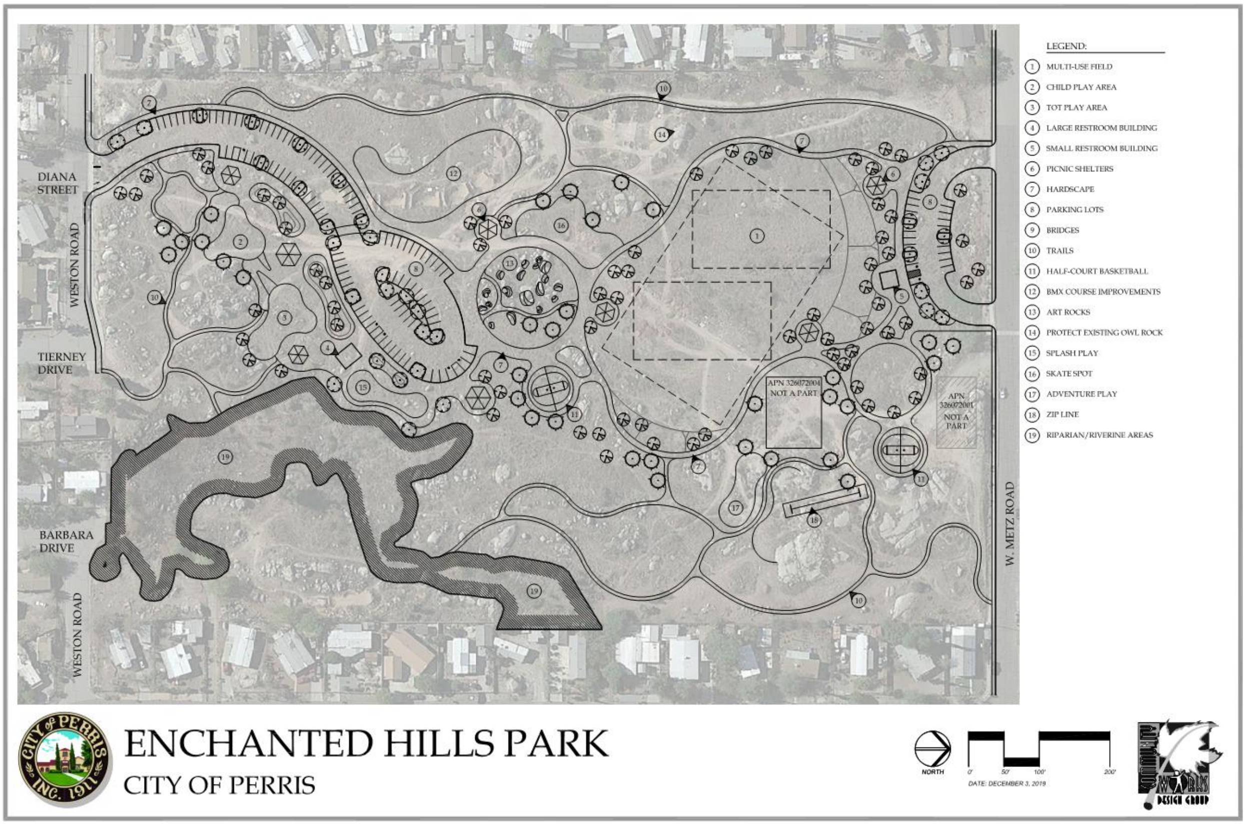


Figure 2 – Preliminary Site Plan



Hydrologic Analysis

CivilCadd/CivilDesign Hydrology - Hydraulics Program Package (CivilDesign Corporation) was used in preparing the rational method hydrologic analysis. The hydrologic models were prepared utilizing the methodology contained in the Riverside County Flood Control and Water Conservation District (RCFC&WCD) Hydrology Manual (April 1978). Supporting calculations are provided in Appendix B. Table 1 presents the peak 10 year and 100-year flow rates at the points of run-on at the north and east property lines, and at the 2 points of discharge at the southerly property line.

Ground surface elevations were obtained from topography from RCFC&WCD based on photography dated 03-29-2011, (4-foot interval contours). The hydrologic soil groups were obtained from the RCFC&WCD Hydrology Manual. All offsite areas were assumed to be Soil Group C. The relatively small areas of Soil Group B were disregarded. Onsite consists of approximately 20% Group B and 80% Group C. The Soil Group Maps are included in Appendix C.

Runoff coefficients used for each subarea were calculated using a weighted average for the land use type and hydrologic soil group. Offsite areas were assumed to be fully developed per the current City of Perris Zoning Map. The weighted average (composite) runoff coefficient calculations and Zoning Map are presented in Appendix C. For water quality purposes it is recommended that offsite flows entering the project from the north (Node 4) be conveyed directly via underground conveyance to the riparian area in the southeast portion of the site (Node 9). This is to prevent mixing offsite flows with flows from onsite developed areas. In this way, offsite contributing flows will not require treatment.

Conclusions

There are two points of discharge from the project along the south boundary. Node 16 near Weston Road and Diana Street, and Node 11 near Weston Road and Barbara Drive. For water quality purposes, some of the site area that flowed to Node 11 in the existing condition has been redirected to Node 16 in the developed condition. This is to prevent untreated flows from developed portions of the site from entering the riparian area being preserved in the south east portion of the site. As a result the runoff analysis shows a slight decrease in discharge at Node 11, and an increase at Node 16 (see Table 1 below). The site will have a water quality basin treating water quality flows from the developed portion of the project. The increase in discharge at Node 16 can be attenuated to match the existing condition by designing the basin as a combined water quality / detention basin.

It is noted that the unit hydrograph analysis of the site using the 2 year 24 hour storm shows less that 5% variation between the existing condition and the developed condition (Hydrograph analysis is included in the PWQMP for the project). This is likely due to the poor condition of the hydrologic ground cover in the existing condition. Assuming the final design of the project produces similar results, the project would be considered exempt from mitigation of the Hydrologic Conditions of Concern.

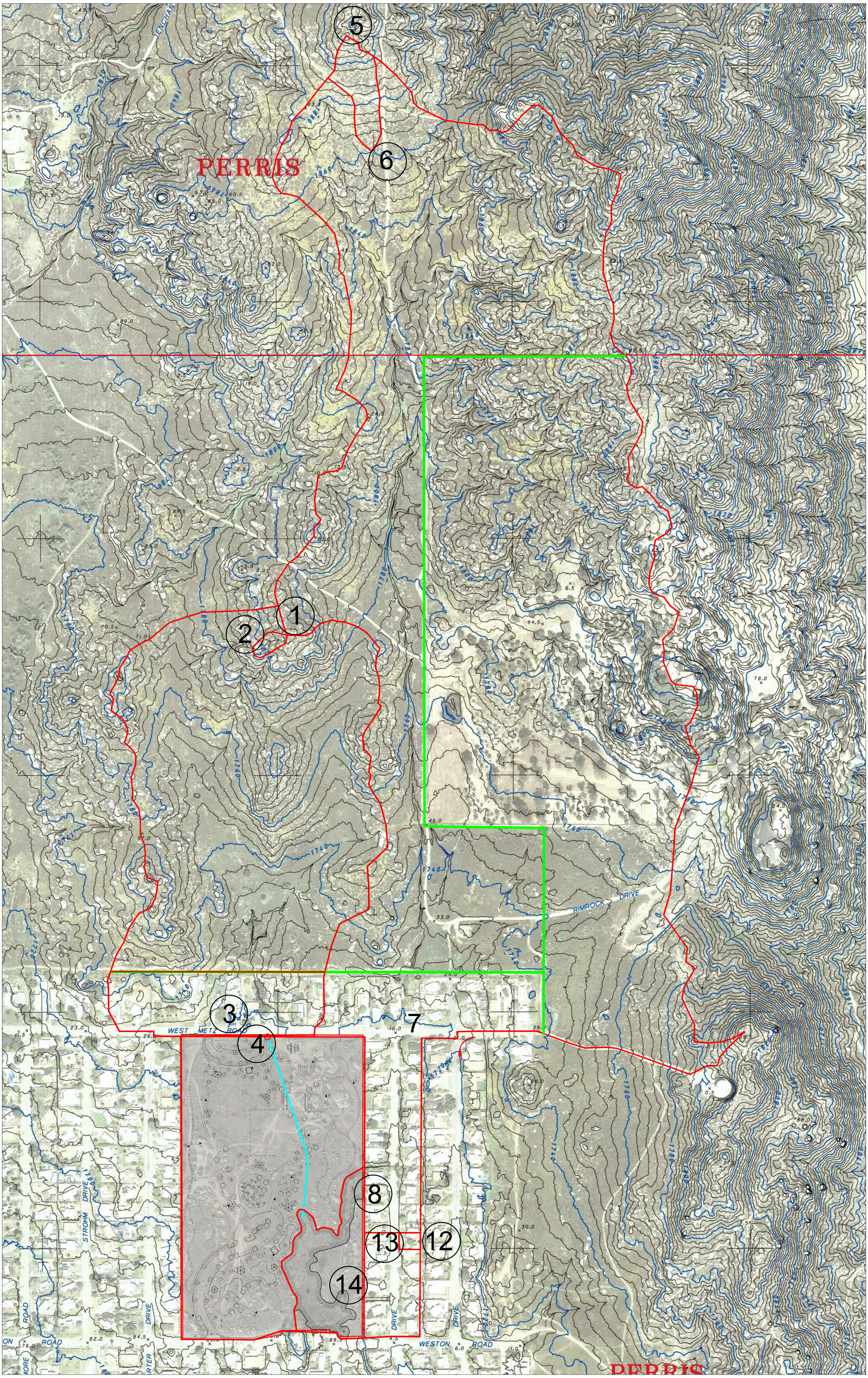
Table 1 - Results of Hydrology Analysis

Description	Node	Existing 10 yr (cfs)	Developed 10 yr (cfs)	Existing 100 yr (cfs)	Developed 100 yr (cfs)
North Boundary	**4**	**-**	**39.57**	**-**	**62.79**
East Boundary Mid Block	**8**	**-**	**100.58**	**-**	**159.523**
East Boundary Southerly	**14**	**-**	**4.09**	**-**	**6.15**
South Boundary (W) at Diana Street	**16**	**5.25**	**10.85**	**7.82**	**17.34**
South Boundary (E) at Barbara Drive	**11**	**137.92**	**136.34**	**218.80**	**216.35**

Note that offsite areas were only analyzed in the fully developed condition

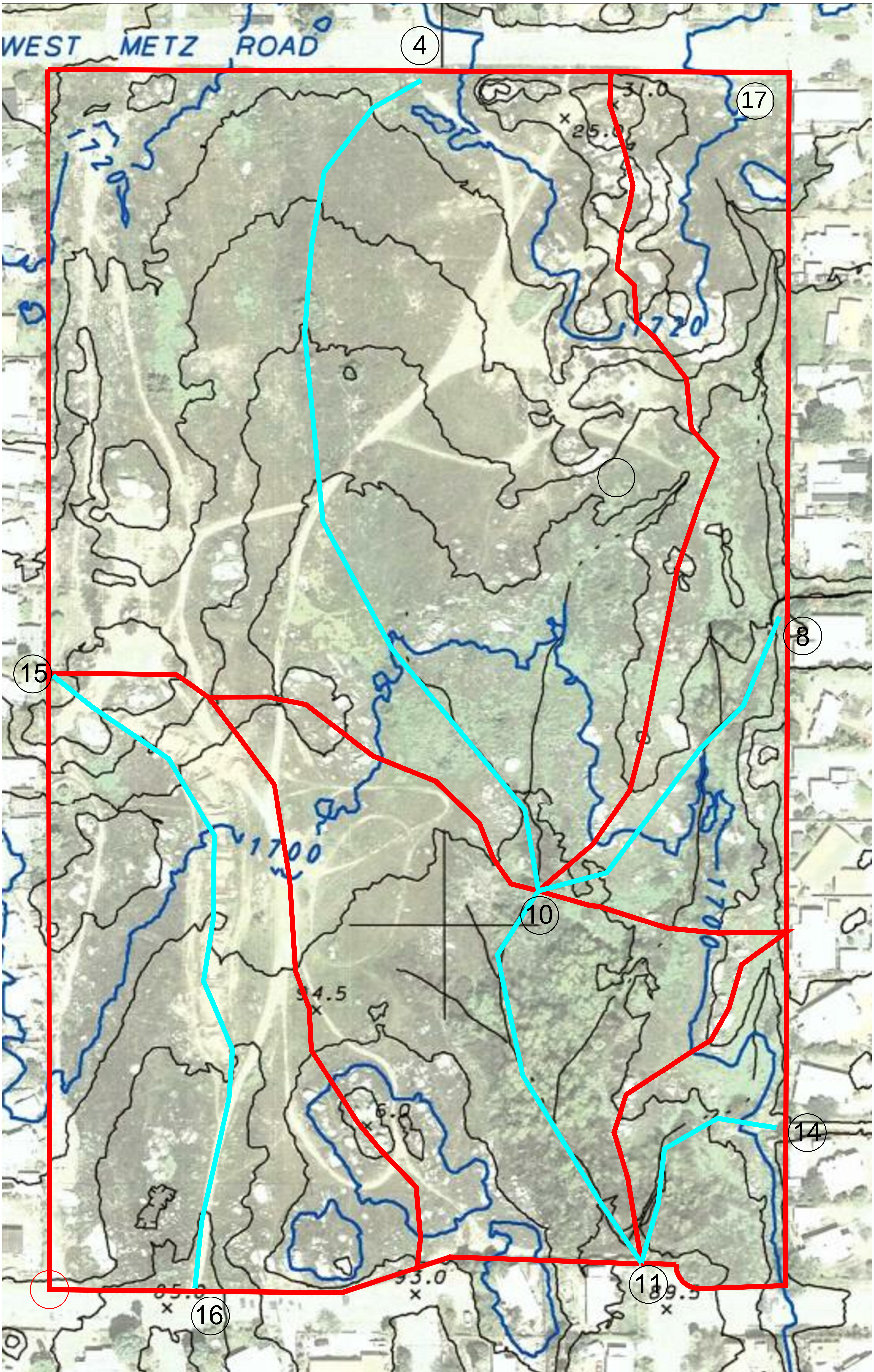
APPENDIX A

RATIONAL METHOD HYDROLOGY WORKMAPS



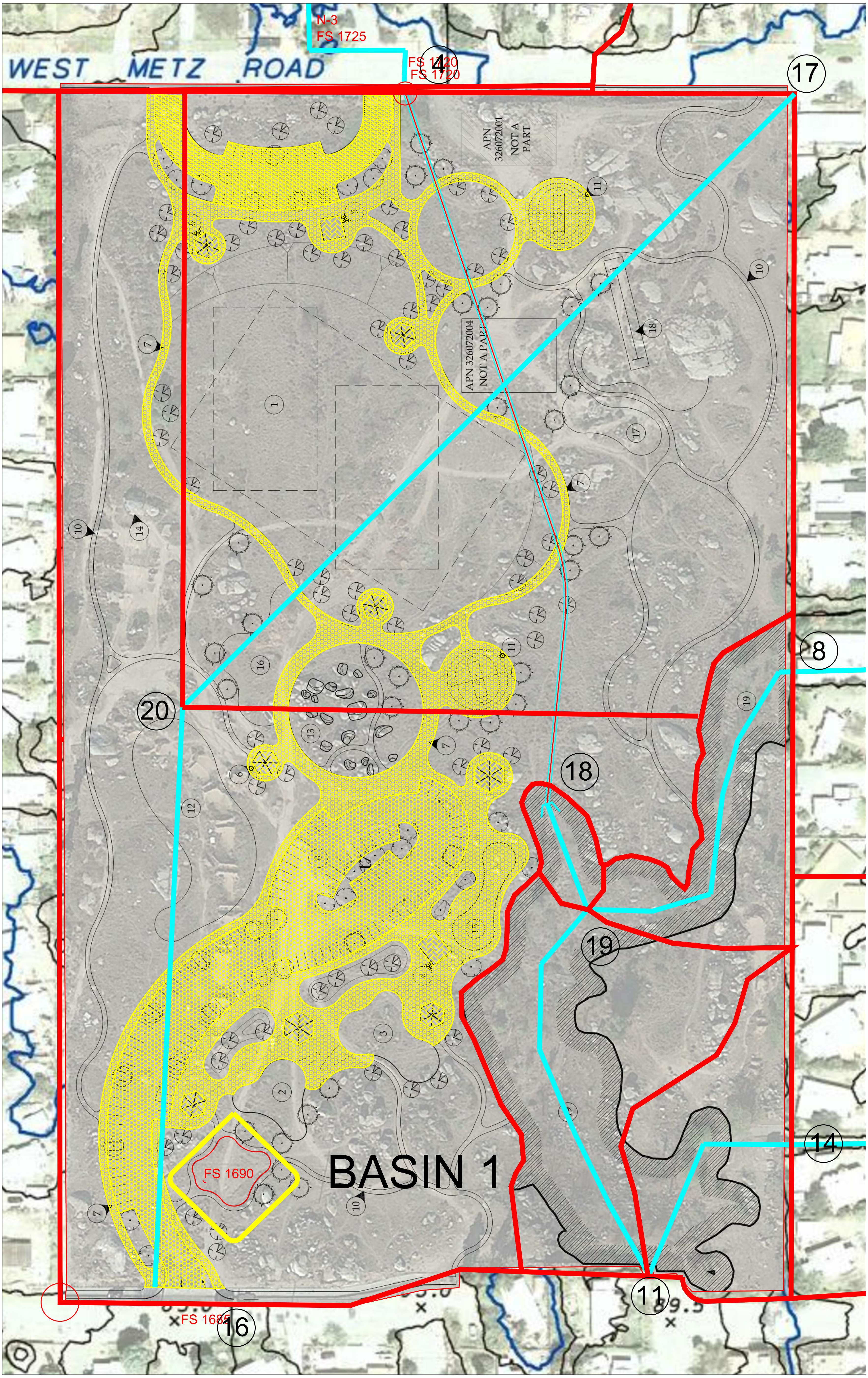
OFFSITE DRAINAGE MAP

1"=400'



ONSITE DRAINAGE MAP
EXISTING CONDITION

1"=100'



ONSITE DRAINAGE MAP
DEVELOPED CONDITION

1"=100'

APPENDIX B

RATIONAL METHOD HYDROLOGY ANALYSIS

Offsite - Existing/Developed Condition 10 Year West Area
Offsite - Existing/Developed Condition 10 Year East Area
Offsite - Existing/Developed Condition 10 Year South East Area
Offsite - Existing/Developed Condition 100 Year West Area
Offsite - Existing/Developed Condition 100 Year East Area
Offsite - Existing/Developed Condition 100 Year South East Area

Onsite - Existing Condition 10 Year West Area
Onsite - Existing Condition 10 Year East Area
Onsite - Existing Condition 100 Year West Area
Onsite - Existing Condition 100 Year East Area
Onsite - Developed Condition 10 Year West Area
Onsite - Developed Condition 10 Year East Area
Onsite - Developed Condition 100 Year West Area
Onsite - Developed Condition 100 Year East Area

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Rational Hydrology Study Date: 01/10/20 File:Rationalenchantedoswest10.out
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Enchanted Hills Park
10 year Existing Condition
Offsite West Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.780(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

____
Initial area flow distance = 166.000(Ft.)
Top (of initial area) elevation = 1814.000(Ft.)
Bottom (of initial area) elevation = 1796.000(Ft.)
Difference in elevation = 18.000(Ft.)
Slope = 0.10843 s(percent)= 10.84
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.556 min.
Rainfall intensity = 2.026(In/Hr) for a 10.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.766
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 79.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 0.341(CFS)
Total initial stream area = 0.220(Ac.)
Pervious area fraction = 1.000

++
Process from Point/Station 2.000 to Point/Station 3.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1796.000(Ft.)
End of natural channel elevation = 1725.000(Ft.)
Length of natural channel = 1937.000(Ft.)
Estimated mean flow rate at midpoint of channel = 26.611(CFS)

Natural mountain channel type used
L.A. County flood control district formula for channel velocity:
Velocity = 5.48(q^.33)(slope^.492)
Velocity using mean channel flow = 3.18(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0367
Corrected/adjusted channel slope = 0.0367
Travel time = 10.15 min. TC = 18.70 min.

Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.716
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 79.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 1.381(In/Hr) for a 10.0 year storm
Subarea runoff = 33.485(CFS) for 33.860(Ac.)
Total runoff = 33.826(CFS) Total area = 34.080(Ac.)

++
Process from Point/Station 3.000 to Point/Station 4.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 1725.000(Ft.)
End of street segment elevation = 1720.000(Ft.)
Length of street segment = 135.000(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 20.000(Ft.)
Distance from crown to crossfall grade break = 18.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020

Street flow is on [1] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.025
Gutter width = 2.000(Ft.)
Gutter hike from flowline = 2.000(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 36.664(CFS)
Depth of flow = 0.576(Ft.), Average velocity = 6.997(Ft/s)
Warning: depth of flow exceeds top of curb
Note: depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property = 3.06(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 20.000(Ft.)
Flow velocity = 7.00(Ft/s)
Travel time = 0.32 min. TC = 19.03 min.
Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.763
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 69.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Rainfall intensity = 1.369(In/Hr) for a 10.0 year storm
Subarea runoff = 5.747(CFS) for 5.500(Ac.)
Total runoff = 39.573(CFS) Total area = 39.580(Ac.)
Street flow at end of street = 39.573(CFS)
Half street flow at end of street = 39.573(CFS)
Depth of flow = 0.589(Ft.), Average velocity = 7.153(Ft/s)
Warning: depth of flow exceeds top of curb
Note: depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property = 3.56(Ft.)
Flow width (from curb towards crown)= 20.000(Ft.)
End of computations, total study area = 39.58 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.931
Area averaged RI index number = 77.6

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Rational Hydrology Study Date: 01/10/20 File:Ratenchantedoseast10.out

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Enchanted Hills Park
10 year Existing Condition
Offsite East Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.780(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 5.000 to Point/Station 6.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 500.000(Ft.)
Top (of initial area) elevation = 1918.000(Ft.)
Bottom (of initial area) elevation = 1860.000(Ft.)
Difference in elevation = 58.000(Ft.)
Slope = 0.11600 s(percent)= 11.60
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.121 min.
Rainfall intensity = 1.643(In/Hr) for a 10.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.740
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 79.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 1.605(CFS)
Total initial stream area = 1.320(Ac.)
Pervious area fraction = 1.000

++
Process from Point/Station 6.000 to Point/Station 7.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1860.000(Ft.)
End of natural channel elevation = 1716.000(Ft.)
Length of natural channel = 3856.000(Ft.)
Estimated mean flow rate at midpoint of channel = 71.383(CFS)

Natural mountain channel type used
L.A. County flood control district formula for channel velocity:
Velocity = 5.48(q^.33)(slope^.492)
Velocity using mean channel flow = 4.45(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0373
Corrected/adjusted channel slope = 0.0373
Travel time = 14.45 min. TC = 27.57 min.

Adding area flow to channel
USER INPUT of soil data for subarea
Runoff Coefficient = 0.692
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 65.00
Pervious area fraction = 0.600; Impervious fraction = 0.400
Rainfall intensity = 1.142(In/Hr) for a 10.0 year storm
Subarea runoff = 90.594(CFS) for 114.750(Ac.)
Total runoff = 92.199(CFS) Total area = 116.070(Ac.)

++
Process from Point/Station 7.000 to Point/Station 8.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 1716.000(Ft.)
End of street segment elevation = 1706.000(Ft.)
Length of street segment = 821.000(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 20.000(Ft.)
Distance from crown to crossfall grade break = 18.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.160
Slope from grade break to crown (v/hz) = 0.020

Street flow is on [2] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 2.000
Gutter width = 2.000(Ft.)
Gutter hike from flowline = 2.000(In.)
Manning's N in gutter = 0.0100
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 96.340(CFS)
Depth of flow = 0.720(Ft.), Average velocity = 6.018(Ft/s)
Warning: depth of flow exceeds top of curb
Note: depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property = 0.11(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 20.000(Ft.)
Flow velocity = 6.02(Ft/s)
Travel time = 2.27 min. TC = 29.85 min.
Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.741
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 69.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Rainfall intensity = 1.098(In/Hr) for a 10.0 year storm
Subarea runoff = 8.384(CFS) for 10.300(Ac.)
Total runoff = 100.583(CFS) Total area = 126.370(Ac.)
Street flow at end of street = 100.583(CFS)
Half street flow at end of street = 50.291(CFS)
Depth of flow = 0.730(Ft.), Average velocity = 6.122(Ft/s)
Warning: depth of flow exceeds top of curb
Note: depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property = 0.12(Ft.)
Flow width (from curb towards crown)= 20.000(Ft.)
End of computations, total study area = 126.37 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.596
Area averaged RI index number = 65.5

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Enchanted Hills Park
10 year Existing Condition
Offsite Southeast Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.780(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 12.000 to Point/Station 13.000
**** INITIAL AREA EVALUATION ****

____

Initial area flow distance = 87.000(Ft.)
Top (of initial area) elevation = 1711.000(Ft.)
Bottom (of initial area) elevation = 1708.000(Ft.)
Difference in elevation = 3.000(Ft.)
Slope = 0.03448 s(percent)= 3.45
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration = 5.000 min.
Rainfall intensity = 2.636(In/Hr) for a 10.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.817
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000

RI index for soil(AMC 2) = 69.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 0.323(CFS)
Total initial stream area = 0.150(Ac.)
Pervious area fraction = 0.500

++
Process from Point/Station 13.000 to Point/Station 14.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 1708.000(Ft.)
End of street segment elevation = 1702.000(Ft.)
Length of street segment = 400.000(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 20.000(Ft.)
Distance from crown to crossfall grade break = 18.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.025
Gutter width = 2.000(Ft.)
Gutter hike from flowline = 2.000(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 2.280(CFS)
Depth of flow = 0.250(Ft.), Average velocity = 2.235(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 6.192(Ft.)
Flow velocity = 2.24(Ft/s)
Travel time = 2.98 min. TC = 7.98 min.
Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.800
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 69.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Rainfall intensity = 2.096(In/Hr) for a 10.0 year storm
Subarea runoff = 3.772(CFS) for 2.250(Ac.)
Total runoff = 4.095(CFS) Total area = 2.400(Ac.)
Street flow at end of street = 4.095(CFS)
Half street flow at end of street = 2.048(CFS)
Depth of flow = 0.292(Ft.), Average velocity = 2.520(Ft/s)
Flow width (from curb towards crown)= 8.281(Ft.)
End of computations, total study area = 2.40 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.500
Area averaged RI index number = 69.0

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Rational Hydrology Study Date: 01/10/20 File:Rationalenchantedoswest100.out

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Enchanted Hills Park
100 year Existing Condition
Offsite West Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.120(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

____

Initial area flow distance = 166.000(Ft.)
Top (of initial area) elevation = 1814.000(Ft.)
Bottom (of initial area) elevation = 1796.000(Ft.)
Difference in elevation = 18.000(Ft.)
Slope = 0.10843 s(percent)= 10.84
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.556 min.
Rainfall intensity = 2.909(In/Hr) for a 100.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.802
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 79.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 0.513(CFS)
Total initial stream area = 0.220(Ac.)
Pervious area fraction = 1.000

++
Process from Point/Station 2.000 to Point/Station 3.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1796.000(Ft.)
End of natural channel elevation = 1725.000(Ft.)
Length of natural channel = 1937.000(Ft.)
Estimated mean flow rate at midpoint of channel = 40.020(CFS)

Natural mountain channel type used
L.A. County flood control district formula for channel velocity:
Velocity = 5.48(q^.33)(slope^.492)
Velocity using mean channel flow = 3.64(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0367
Corrected/adjusted channel slope = 0.0367
Travel time = 8.87 min. TC = 17.43 min.

Adding area flow to channel
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.767
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 79.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 2.053(In/Hr) for a 100.0 year storm
Subarea runoff = 53.344(CFS) for 33.860(Ac.)
Total runoff = 53.858(CFS) Total area = 34.080(Ac.)

++
Process from Point/Station 3.000 to Point/Station 4.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 1725.000(Ft.)
End of street segment elevation = 1720.000(Ft.)
Length of street segment = 135.000(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 20.000(Ft.)
Distance from crown to crossfall grade break = 18.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020

Street flow is on [1] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.025
Gutter width = 2.000(Ft.)
Gutter hike from flowline = 2.000(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 58.295(CFS)
Depth of flow = 0.660(Ft.), Average velocity = 7.989(Ft/s)
Warning: depth of flow exceeds top of curb
Note: depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property = 6.39(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 20.000(Ft.)
Flow velocity = 7.99(Ft/s)
Travel time = 0.28 min. TC = 17.71 min.
Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.798
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 69.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Rainfall intensity = 2.037(In/Hr) for a 100.0 year storm
Subarea runoff = 8.936(CFS) for 5.500(Ac.)
Total runoff = 62.794(CFS) Total area = 39.580(Ac.)
Street flow at end of street = 62.794(CFS)
Half street flow at end of street = 62.794(CFS)
Depth of flow = 0.675(Ft.), Average velocity = 8.158(Ft/s)
Warning: depth of flow exceeds top of curb
Note: depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property = 6.99(Ft.)
Flow width (from curb towards crown)= 20.000(Ft.)
End of computations, total study area = 39.58 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.931
Area averaged RI index number = 77.6

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Rational Hydrology Study Date: 01/10/20 File:Ratenchantedoseast100.out

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Enchanted Hills Park
100 year Existing Condition
Offsite East Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.120(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 5.000 to Point/Station 6.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 500.000(Ft.)
Top (of initial area) elevation = 1918.000(Ft.)
Bottom (of initial area) elevation = 1860.000(Ft.)
Difference in elevation = 58.000(Ft.)
Slope = 0.11600 s(percent)= 11.60
TC = k(0.710)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 13.121 min.
Rainfall intensity = 2.359(In/Hr) for a 100.0 year storm
UNDEVELOPED (fair cover) subarea
Runoff Coefficient = 0.782
Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 79.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 2.436(CFS)
Total initial stream area = 1.320(Ac.)
Pervious area fraction = 1.000

++
Process from Point/Station 6.000 to Point/Station 7.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1860.000(Ft.)
End of natural channel elevation = 1716.000(Ft.)
Length of natural channel = 3856.000(Ft.)
Estimated mean flow rate at midpoint of channel = 108.334(CFS)

Natural mountain channel type used
L.A. County flood control district formula for channel velocity:
Velocity = 5.48(q^.33)(slope^.492)
Velocity using mean channel flow = 5.10(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0373
Corrected/adjusted channel slope = 0.0373
Travel time = 12.59 min. TC = 25.72 min.

Adding area flow to channel
USER INPUT of soil data for subarea
Runoff Coefficient = 0.739
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 65.00
Pervious area fraction = 0.600; Impervious fraction = 0.400
Rainfall intensity = 1.696(In/Hr) for a 100.0 year storm
Subarea runoff = 143.932(CFS) for 114.750(Ac.)
Total runoff = 146.369(CFS) Total area = 116.070(Ac.)

++
Process from Point/Station 7.000 to Point/Station 8.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 1716.000(Ft.)
End of street segment elevation = 1706.000(Ft.)
Length of street segment = 821.000(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 20.000(Ft.)
Distance from crown to crossfall grade break = 18.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.160

Slope from grade break to crown (v/hz) = 0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 2.000
Gutter width = 2.000(Ft.)
Gutter hike from flowline = 2.000(In.)
Manning's N in gutter = 0.0100
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 152.863(CFS)
Depth of flow = 0.848(Ft.), Average velocity = 7.227(Ft/s)
Warning: depth of flow exceeds top of curb
Note: depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property = 0.17(Ft.)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 20.000(Ft.)
Flow velocity = 7.23(Ft/s)
Travel time = 1.89 min. TC = 27.61 min.
Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.780
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 69.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Rainfall intensity = 1.638(In/Hr) for a 100.0 year storm
Subarea runoff = 13.154(CFS) for 10.300(Ac.)
Total runoff = 159.523(CFS) Total area = 126.370(Ac.)
Street flow at end of street = 159.523(CFS)
Half street flow at end of street = 79.761(CFS)
Depth of flow = 0.861(Ft.), Average velocity = 7.350(Ft/s)
Warning: depth of flow exceeds top of curb
Note: depth of flow exceeds top of street crown.
Distance that curb overflow reaches into property = 0.18(Ft.)
Flow width (from curb towards crown)= 20.000(Ft.)
End of computations, total study area = 126.37 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.596
Area averaged RI index number = 65.5

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Rational Hydrology Study   Date: 01/10/20 File:RatenchantedosSE100.out

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Enchanted Hills Park
100 year Existing Condition
Offsite Southeast Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.120(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 12.000 to Point/Station 13.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 87.000(Ft.)
Top (of initial area) elevation = 1711.000(Ft.)
Bottom (of initial area) elevation = 1708.000(Ft.)
Difference in elevation = 3.000(Ft.)
Slope = 0.03448 s(percent)= 3.45
TC = k(0.390)*[(length^3)/(elevation change)]^0.2
Warning: TC computed to be less than 5 min.; program is assuming the
time of concentration is 5 minutes.
Initial area time of concentration = 5.000 min.
Rainfall intensity = 3.785(In/Hr) for a 100.0 year storm
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.839
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000

Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 69.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Initial subarea runoff = 0.476(CFS)
Total initial stream area = 0.150(Ac.)
Pervious area fraction = 0.500

++
Process from Point/Station 13.000 to Point/Station 14.000
**** STREET FLOW TRAVEL TIME + SUBAREA FLOW ADDITION ****

Top of street segment elevation = 1708.000(Ft.)
End of street segment elevation = 1702.000(Ft.)
Length of street segment = 400.000(Ft.)
Height of curb above gutter flowline = 6.0(In.)
Width of half street (curb to crown) = 20.000(Ft.)
Distance from crown to crossfall grade break = 18.000(Ft.)
Slope from gutter to grade break (v/hz) = 0.020
Slope from grade break to crown (v/hz) = 0.020
Street flow is on [2] side(s) of the street
Distance from curb to property line = 10.000(Ft.)
Slope from curb to property line (v/hz) = 0.025
Gutter width = 2.000(Ft.)
Gutter hike from flowline = 2.000(In.)
Manning's N in gutter = 0.0150
Manning's N from gutter to grade break = 0.0150
Manning's N from grade break to crown = 0.0150
Estimated mean flow rate at midpoint of street = 3.411(CFS)
Depth of flow = 0.279(Ft.), Average velocity = 2.424(Ft/s)
Streetflow hydraulics at midpoint of street travel:
Halfstreet flow width = 7.597(Ft.)
Flow velocity = 2.42(Ft/s)
Travel time = 2.75 min. TC = 7.75 min.
Adding area flow to street
SINGLE FAMILY (1/4 Acre Lot)
Runoff Coefficient = 0.826
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 69.00
Pervious area fraction = 0.500; Impervious fraction = 0.500
Rainfall intensity = 3.053(In/Hr) for a 100.0 year storm
Subarea runoff = 5.675(CFS) for 2.250(Ac.)
Total runoff = 6.151(CFS) Total area = 2.400(Ac.)
Street flow at end of street = 6.151(CFS)
Half street flow at end of street = 3.076(CFS)
Depth of flow = 0.325(Ft.), Average velocity = 2.760(Ft/s)
Flow width (from curb towards crown)= 9.939(Ft.)
End of computations, total study area = 2.40 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 0.500
Area averaged RI index number = 69.0

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Rational Hydrology Study Date: 01/12/20 File:EHexW10.out

Enchanted Hills Park
Onsite Existing Condition
10 year storm
West Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.780(In/Hr)
Slope of intensity duration curve = 0.4900

++

Process from Point/Station 15.000 to Point/Station 16.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 726.000(Ft.)
Top (of initial area) elevation = 1714.000(Ft.)
Bottom (of initial area) elevation = 1685.000(Ft.)
Difference in elevation = 29.000(Ft.)
Slope = 0.03994 s(percent)= 3.99
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.072 min.
Rainfall intensity = 1.587(In/Hr) for a 10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.792
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 86.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 5.254(CFS)
Total initial stream area = 4.180(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 4.18 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 86.0

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Rational Hydrology Study   Date: 01/12/20 File:EHex10East.out

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Enchanted Hills Park
Onsite Existing Condition
10 Year Storm
East Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) =   10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.780(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station   4.000 to Point/Station   10.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

____

Rainfall intensity =   1.369(In/Hr) for a   10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.777
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 86.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 19.03 min. Rain intensity =   1.37(In/Hr)
Total area =   10.00(Ac.) Total runoff =   39.57(CFS)

++
Process from Point/Station 10.000 to Point/Station 10.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 10.000(Ac.)
Runoff from this stream = 39.570(CFS)
Time of concentration = 19.03 min.
Rainfall intensity = 1.369(In/Hr)

++
Process from Point/Station 8.000 to Point/Station 10.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 1.098(In/Hr) for a 10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.751
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 86.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 29.85 min. Rain intensity = 1.10(In/Hr)
Total area = 3.10(Ac.) Total runoff = 100.58(CFS)

++
Process from Point/Station 8.000 to Point/Station 10.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 3.100(Ac.)
Runoff from this stream = 100.580(CFS)
Time of concentration = 29.85 min.
Rainfall intensity = 1.098(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	39.570	19.03	1.369
2	100.580	29.85	1.098

Largest stream flow has longer time of concentration
Qp = 100.580 + sum of
Qb Ia/Ib
39.570 * 0.802 = 31.737
Qp = 132.317

Total of 2 streams to confluence:
Flow rates before confluence point:

39.570   100.580
Area of streams before confluence:
10.000   3.100
Results of confluence:
Total flow rate =   132.317(CFS)
Time of concentration =   29.850 min.
Effective stream area after confluence =   13.100(Ac.)

++
Process from Point/Station   10.000 to Point/Station   11.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation =   1694.500(Ft.)
End of natural channel elevation =   1689.500(Ft.)
Length of natural channel =   438.000(Ft.)
Estimated mean flow rate at midpoint of channel =   154.235(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   5.78(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0114
Corrected/adjusted channel slope = 0.0114
Travel time =   1.26 min.   TC =   31.11 min.

Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.749
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 86.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity =   1.076(In/Hr) for a   10.0 year storm
Subarea runoff =   3.498(CFS) for   4.340(Ac.)
Total runoff =   135.815(CFS)   Total area =   17.440(Ac.)

++
Process from Point/Station   11.000 to Point/Station   11.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area =   17.440(Ac.)
Runoff from this stream =   135.815(CFS)
Time of concentration =   31.11 min.
Rainfall intensity =   1.076(In/Hr)

++

Process from Point/Station 14.000 to Point/Station 11.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 2.096(In/Hr) for a 10.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.816
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 86.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 7.98 min. Rain intensity = 2.10(In/Hr)
Total area = 1.03(Ac.) Total runoff = 4.09(CFS)

++
Process from Point/Station 14.000 to Point/Station 11.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 1.030(Ac.)
Runoff from this stream = 4.090(CFS)
Time of concentration = 7.98 min.
Rainfall intensity = 2.096(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	135.815	31.11	1.076
2	4.090	7.98	2.096

Largest stream flow has longer time of concentration
Qp = 135.815 + sum of
Qb Ia/Ib
4.090 * 0.513 = 2.100
Qp = 137.915

Total of 2 streams to confluence:
Flow rates before confluence point:
135.815 4.090
Area of streams before confluence:
17.440 1.030
Results of confluence:
Total flow rate = 137.915(CFS)
Time of concentration = 31.112 min.
Effective stream area after confluence = 18.470(Ac.)
End of computations, total study area = 18.47 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 86.0

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Rational Hydrology Study Date: 01/12/20 File:EHexW100.out

Enchanted Hills Park
Onsite Existing Condition
100 Year Storm
West Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.120(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 15.000 to Point/Station 16.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 726.000(Ft.)
Top (of initial area) elevation = 1714.000(Ft.)
Bottom (of initial area) elevation = 1685.000(Ft.)
Difference in elevation = 29.000(Ft.)
Slope = 0.03994 s(percent)= 3.99
TC = k(0.530)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 14.072 min.
Rainfall intensity = 2.279(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.822
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000

Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 86.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 7.829(CFS)
Total initial stream area = 4.180(Ac.)
Pervious area fraction = 1.000
End of computations, total study area = 4.18 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 86.0

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Rational Hydrology Study Date: 01/12/20 File:EHex100East.out

Enchanted Hills Park
Onsite Existing Condition
100 Year Storm
East Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.120(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 4.000 to Point/Station 10.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

____

Rainfall intensity = 2.037(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.813
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 86.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 17.71 min. Rain intensity = 2.04(In/Hr)
Total area = 10.00(Ac.) Total runoff = 62.79(CFS)

++
Process from Point/Station 10.000 to Point/Station 10.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 10.000(Ac.)
Runoff from this stream = 62.790(CFS)
Time of concentration = 17.71 min.
Rainfall intensity = 2.037(In/Hr)

++
Process from Point/Station 8.000 to Point/Station 10.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 1.638(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.795
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 86.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 27.61 min. Rain intensity = 1.64(In/Hr)
Total area = 3.10(Ac.) Total runoff = 159.52(CFS)

++
Process from Point/Station 8.000 to Point/Station 10.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 3.100(Ac.)
Runoff from this stream = 159.520(CFS)
Time of concentration = 27.61 min.
Rainfall intensity = 1.638(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	62.790	17.71	2.037
2	159.520	27.61	1.638

Largest stream flow has longer time of concentration
Qp = 159.520 + sum of
Qb Ia/Ib
62.790 * 0.804 = 50.512
Qp = 210.032

Total of 2 streams to confluence:
Flow rates before confluence point:

62.790   159.520
Area of streams before confluence:
10.000   3.100
Results of confluence:
Total flow rate =   210.032(CFS)
Time of concentration =   27.610 min.
Effective stream area after confluence =   13.100(Ac.)

++
Process from Point/Station   10.000 to Point/Station   11.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation =   1694.500(Ft.)
End of natural channel elevation =   1689.500(Ft.)
Length of natural channel =   438.000(Ft.)
Estimated mean flow rate at midpoint of channel =   244.824(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow =   6.67(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0114
Corrected/adjusted channel slope = 0.0114
Travel time =   1.09 min.   TC =   28.70 min.

Adding area flow to channel
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.793
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 86.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity =   1.607(In/Hr) for a   100.0 year storm
Subarea runoff =   5.532(CFS) for   4.340(Ac.)
Total runoff =   215.564(CFS)   Total area =   17.440(Ac.)

++
Process from Point/Station   11.000 to Point/Station   11.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area =   17.440(Ac.)
Runoff from this stream =   215.564(CFS)
Time of concentration =   28.70 min.
Rainfall intensity =   1.607(In/Hr)

++

Process from Point/Station 14.000 to Point/Station 11.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 3.053(In/Hr) for a 100.0 year storm
UNDEVELOPED (poor cover) subarea
Runoff Coefficient = 0.840
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 86.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 7.75 min. Rain intensity = 3.05(In/Hr)
Total area = 1.03(Ac.) Total runoff = 6.15(CFS)

++
Process from Point/Station 14.000 to Point/Station 11.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 1.030(Ac.)
Runoff from this stream = 6.150(CFS)
Time of concentration = 7.75 min.
Rainfall intensity = 3.053(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	215.564	28.70	1.607
2	6.150	7.75	3.053

Largest stream flow has longer time of concentration
Qp = 215.564 + sum of
Qb Ia/Ib
6.150 * 0.526 = 3.238
Qp = 218.801

Total of 2 streams to confluence:
Flow rates before confluence point:
215.564 6.150
Area of streams before confluence:
17.440 1.030
Results of confluence:
Total flow rate = 218.801(CFS)
Time of concentration = 28.704 min.
Effective stream area after confluence = 18.470(Ac.)
End of computations, total study area = 18.47 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 86.0

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Rational Hydrology Study   Date: 01/12/20 File:EHdev10West.out

----

Enchanted Hills Park
Onsite Developed Condition
10 year Storm
West Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.780(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 17.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 930.000(Ft.)
Top (of initial area) elevation = 1718.500(Ft.)
Bottom (of initial area) elevation = 1712.000(Ft.)
Difference in elevation = 6.500(Ft.)
Slope = 0.00699 s(percent)= 0.70
TC = k(0.940)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 39.051 min.
Rainfall intensity = 0.963(In/Hr) for a 10.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.605
Decimal fraction soil group A = 0.000

Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 5.578(CFS)
Total initial stream area = 9.570(Ac.)
Pervious area fraction = 1.000

++
Process from Point/Station 20.000 to Point/Station 16.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1712.000(Ft.)
End of natural channel elevation = 1685.000(Ft.)
Length of natural channel = 580.000(Ft.)
Estimated mean flow rate at midpoint of channel = 8.296(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow = 5.15(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0466
Corrected/adjusted channel slope = 0.0466
Travel time = 1.88 min. TC = 40.93 min.

Adding area flow to channel
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.601
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 0.941(In/Hr) for a 10.0 year storm
Subarea runoff = 5.274(CFS) for 9.330(Ac.)
Total runoff = 10.851(CFS) Total area = 18.900(Ac.)
End of computations, total study area = 18.90 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 74.0

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Rational Hydrology Study Date: 01/12/20 File:EHdev10East.out

Enchanted Hills Park
Onsite Developed Condition
10 Year Storm
East Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 10.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 10.0
Calculated rainfall intensity data:
1 hour intensity = 0.780(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 4.000 to Point/Station 4.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 1.369(In/Hr) for a 10.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.671
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 19.03 min. Rain intensity = 1.37(In/Hr)
Total area = 0.00(Ac.) Total runoff = 39.57(CFS)

++
Process from Point/Station 4.000 to Point/Station 18.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1720.000(Ft.)
Downstream point/station elevation = 1696.000(Ft.)
Pipe length = 740.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 39.570(CFS)
Nearest computed pipe diameter = 24.00(In.)
Calculated individual pipe flow = 39.570(CFS)
Normal flow depth in pipe = 19.08(In.)
Flow top width inside pipe = 19.38(In.)
Critical depth could not be calculated.
Pipe flow velocity = 14.78(Ft/s)
Travel time through pipe = 0.83 min.
Time of concentration (TC) = 19.86 min.

++
Process from Point/Station 18.000 to Point/Station 19.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1696.000(Ft.)
End of natural channel elevation = 1694.500(Ft.)
Length of natural channel = 120.190(Ft.)
Estimated mean flow rate at midpoint of channel = 1.#IO(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow = 1.#J(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0125
Corrected/adjusted channel slope = 0.0125
Travel time = 0.00 min. TC = 19.86 min.

Adding area flow to channel
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.667
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 1.341(In/Hr) for a 10.0 year storm
Subarea runoff = 0.152(CFS) for 0.170(Ac.)
Total runoff = 39.722(CFS) Total area = 0.170(Ac.)

++

Process from Point/Station 19.000 to Point/Station 19.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 0.170(Ac.)
Runoff from this stream = 39.722(CFS)
Time of concentration = 19.86 min.
Rainfall intensity = 1.341(In/Hr)

++
Process from Point/Station 8.000 to Point/Station 19.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 1.098(In/Hr) for a 10.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.631
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 29.85 min. Rain intensity = 1.10(In/Hr)
Total area = 0.91(Ac.) Total runoff = 100.58(CFS)

++
Process from Point/Station 8.000 to Point/Station 19.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 0.910(Ac.)
Runoff from this stream = 100.580(CFS)
Time of concentration = 29.85 min.
Rainfall intensity = 1.098(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	39.722	19.86	1.341
2	100.580	29.85	1.098

Largest stream flow has longer time of concentration
Qp = 100.580 + sum of
Qb Ia/Ib
39.722 * 0.819 = 32.536
Qp = 133.116

Total of 2 streams to confluence:
Flow rates before confluence point:
39.722 100.580
Area of streams before confluence:
0.170 0.910

Results of confluence:
Total flow rate = 133.116(CFS)
Time of concentration = 29.850 min.
Effective stream area after confluence = 1.080(Ac.)

++
Process from Point/Station 19.000 to Point/Station 11.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1694.500(Ft.)
End of natural channel elevation = 1689.500(Ft.)
Length of natural channel = 432.000(Ft.)
Estimated mean flow rate at midpoint of channel = 234.802(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow = 6.63(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0116
Corrected/adjusted channel slope = 0.0116
Travel time = 1.09 min. TC = 30.94 min.

Adding area flow to channel
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.628
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 1.079(In/Hr) for a 10.0 year storm
Subarea runoff = 1.117(CFS) for 1.650(Ac.)
Total runoff = 134.234(CFS) Total area = 2.730(Ac.)

++
Process from Point/Station 11.000 to Point/Station 11.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 2.730(Ac.)
Runoff from this stream = 134.234(CFS)
Time of concentration = 30.94 min.
Rainfall intensity = 1.079(In/Hr)

++
Process from Point/Station 14.000 to Point/Station 11.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 2.096(In/Hr) for a 10.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.736
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 7.98 min. Rain intensity = 2.10(In/Hr)
Total area = 1.03(Ac.) Total runoff = 4.09(CFS)

++
Process from Point/Station 14.000 to Point/Station 11.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 1.030(Ac.)
Runoff from this stream = 4.090(CFS)
Time of concentration = 7.98 min.
Rainfall intensity = 2.096(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	134.234	30.94	1.079
2	4.090	7.98	2.096

Largest stream flow has longer time of concentration
Qp = 134.234 + sum of
Qb Ia/Ib
4.090 * 0.515 = 2.106
Qp = 136.339

Total of 2 streams to confluence:
Flow rates before confluence point:
134.234 4.090
Area of streams before confluence:
2.730 1.030
Results of confluence:
Total flow rate = 136.339(CFS)
Time of concentration = 30.936 min.
Effective stream area after confluence = 3.760(Ac.)
End of computations, total study area = 3.76 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 74.0

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Rational Hydrology Study Date: 01/12/20 File:EHdev100West.out

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Enchanted Hills Park
Onsite Developed Condition
100 Year Storm
West Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.120(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 17.000 to Point/Station 20.000
**** INITIAL AREA EVALUATION ****

Initial area flow distance = 930.000(Ft.)
Top (of initial area) elevation = 1718.500(Ft.)
Bottom (of initial area) elevation = 1712.000(Ft.)
Difference in elevation = 6.500(Ft.)
Slope = 0.00699 s(percent)= 0.70
TC = k(0.940)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 39.051 min.
Rainfall intensity = 1.382(In/Hr) for a 100.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.672

Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Initial subarea runoff = 8.892(CFS)
Total initial stream area = 9.570(Ac.)
Pervious area fraction = 1.000

++
Process from Point/Station 20.000 to Point/Station 16.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1712.000(Ft.)
End of natural channel elevation = 1685.000(Ft.)
Length of natural channel = 580.000(Ft.)
Estimated mean flow rate at midpoint of channel = 13.227(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow = 5.79(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0466
Corrected/adjusted channel slope = 0.0466
Travel time = 1.67 min. TC = 40.72 min.

Adding area flow to channel
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.669
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 1.354(In/Hr) for a 100.0 year storm
Subarea runoff = 8.449(CFS) for 9.330(Ac.)
Total runoff = 17.342(CFS) Total area = 18.900(Ac.)
End of computations, total study area = 18.90 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 74.0

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Rational Hydrology Study Date: 01/12/20 File:EHdev100East.out

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Enchanted Hills Park
Onsite Developed Condition
100 Year Storm
East Area

********* Hydrology Study Control Information **********

English (in-lb) Units used in input data file

Program License Serial Number 4011

Rational Method Hydrology Program based on
Riverside County Flood Control & Water Conservation District
1978 hydrology manual

Storm event (year) = 100.00 Antecedent Moisture Condition = 2

Standard intensity-duration curves data (Plate D-4.1)
For the [Perris Valley] area used.
10 year storm 10 minute intensity = 1.880(In/Hr)
10 year storm 60 minute intensity = 0.780(In/Hr)
100 year storm 10 minute intensity = 2.690(In/Hr)
100 year storm 60 minute intensity = 1.120(In/Hr)

Storm event year = 100.0
Calculated rainfall intensity data:
1 hour intensity = 1.120(In/Hr)
Slope of intensity duration curve = 0.4900

++
Process from Point/Station 4.000 to Point/Station 4.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

____

Rainfall intensity = 2.037(In/Hr) for a 100.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.732
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 17.71 min. Rain intensity = 2.04(In/Hr)
Total area = 0.00(Ac.) Total runoff = 62.79(CFS)

++
Process from Point/Station 4.000 to Point/Station 18.000
**** PIPEFLOW TRAVEL TIME (Program estimated size) ****

Upstream point/station elevation = 1720.000(Ft.)
Downstream point/station elevation = 1696.000(Ft.)
Pipe length = 740.00(Ft.) Manning's N = 0.013
No. of pipes = 1 Required pipe flow = 62.790(CFS)
Nearest computed pipe diameter = 30.00(In.)
Calculated individual pipe flow = 62.790(CFS)
Normal flow depth in pipe = 21.23(In.)
Flow top width inside pipe = 27.29(In.)
Critical depth could not be calculated.
Pipe flow velocity = 16.89(Ft/s)
Travel time through pipe = 0.73 min.
Time of concentration (TC) = 18.44 min.

++
Process from Point/Station 18.000 to Point/Station 19.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1696.000(Ft.)
End of natural channel elevation = 1694.500(Ft.)
Length of natural channel = 120.190(Ft.)
Estimated mean flow rate at midpoint of channel = 1.#IO(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow = 1.#J(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0125
Corrected/adjusted channel slope = 0.0125
Travel time = 0.00 min. TC = 18.44 min.

Adding area flow to channel
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.729
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 1.997(In/Hr) for a 100.0 year storm
Subarea runoff = 0.247(CFS) for 0.170(Ac.)
Total runoff = 63.037(CFS) Total area = 0.170(Ac.)

++

Process from Point/Station 19.000 to Point/Station 19.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 0.170(Ac.)
Runoff from this stream = 63.037(CFS)
Time of concentration = 18.44 min.
Rainfall intensity = 1.997(In/Hr)

++
Process from Point/Station 8.000 to Point/Station 19.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 1.638(In/Hr) for a 100.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.700
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 27.61 min. Rain intensity = 1.64(In/Hr)
Total area = 0.91(Ac.) Total runoff = 159.52(CFS)

++
Process from Point/Station 8.000 to Point/Station 19.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 0.910(Ac.)
Runoff from this stream = 159.520(CFS)
Time of concentration = 27.61 min.
Rainfall intensity = 1.638(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	63.037	18.44	1.997
2	159.520	27.61	1.638

Largest stream flow has longer time of concentration
Qp = 159.520 + sum of
Qb Ia/Ib
63.037 * 0.821 = 51.725
Qp = 211.245

Total of 2 streams to confluence:
Flow rates before confluence point:
63.037 159.520
Area of streams before confluence:
0.170 0.910

Results of confluence:
Total flow rate = 211.245(CFS)
Time of concentration = 27.610 min.
Effective stream area after confluence = 1.080(Ac.)

++
Process from Point/Station 19.000 to Point/Station 11.000
**** NATURAL CHANNEL TIME + SUBAREA FLOW ADDITION ****

Top of natural channel elevation = 1694.500(Ft.)
End of natural channel elevation = 1689.500(Ft.)
Length of natural channel = 432.000(Ft.)
Estimated mean flow rate at midpoint of channel = 372.613(CFS)

Natural valley channel type used
L.A. County flood control district formula for channel velocity:
Velocity(ft/s) = (7 + 8(q(English Units)^.352)(slope^0.5)
Velocity using mean channel flow = 7.67(Ft/s)

Correction to map slope used on extremely rugged channels with
drops and waterfalls (Plate D-6.2)
Normal channel slope = 0.0116
Corrected/adjusted channel slope = 0.0116
Travel time = 0.94 min. TC = 28.55 min.

Adding area flow to channel
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.697
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
Rainfall intensity = 1.612(In/Hr) for a 100.0 year storm
Subarea runoff = 1.854(CFS) for 1.650(Ac.)
Total runoff = 213.099(CFS) Total area = 2.730(Ac.)

++
Process from Point/Station 11.000 to Point/Station 11.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 1
Stream flow area = 2.730(Ac.)
Runoff from this stream = 213.099(CFS)
Time of concentration = 28.55 min.
Rainfall intensity = 1.612(In/Hr)

++
Process from Point/Station 14.000 to Point/Station 11.000
**** USER DEFINED FLOW INFORMATION AT A POINT ****

Rainfall intensity = 3.053(In/Hr) for a 100.0 year storm
UNDEVELOPED (good cover) subarea
Runoff Coefficient = 0.780
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 1.000
Decimal fraction soil group D = 0.000
RI index for soil(AMC 2) = 74.00
Pervious area fraction = 1.000; Impervious fraction = 0.000
User specified values are as follows:
TC = 7.75 min. Rain intensity = 3.05(In/Hr)
Total area = 1.03(Ac.) Total runoff = 6.15(CFS)

++
Process from Point/Station 14.000 to Point/Station 11.000
**** CONFLUENCE OF MINOR STREAMS ****

Along Main Stream number: 1 in normal stream number 2
Stream flow area = 1.030(Ac.)
Runoff from this stream = 6.150(CFS)
Time of concentration = 7.75 min.
Rainfall intensity = 3.053(In/Hr)
Summary of stream data:

Stream No.	Flow rate (CFS)	TC (min)	Rainfall Intensity (In/Hr)
1	213.099	28.55	1.612
2	6.150	7.75	3.053

Largest stream flow has longer time of concentration
Qp = 213.099 + sum of
Qb Ia/Ib
6.150 * 0.528 = 3.246
Qp = 216.346

Total of 2 streams to confluence:
Flow rates before confluence point:
213.099 6.150
Area of streams before confluence:
2.730 1.030
Results of confluence:
Total flow rate = 216.346(CFS)
Time of concentration = 28.549 min.
Effective stream area after confluence = 3.760(Ac.)
End of computations, total study area = 3.76 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.

Area averaged pervious area fraction(Ap) = 1.000
Area averaged RI index number = 74.0

APPENDIX C

COMPOSITE RUNOFF COEFFICIENT CALCULATIONS

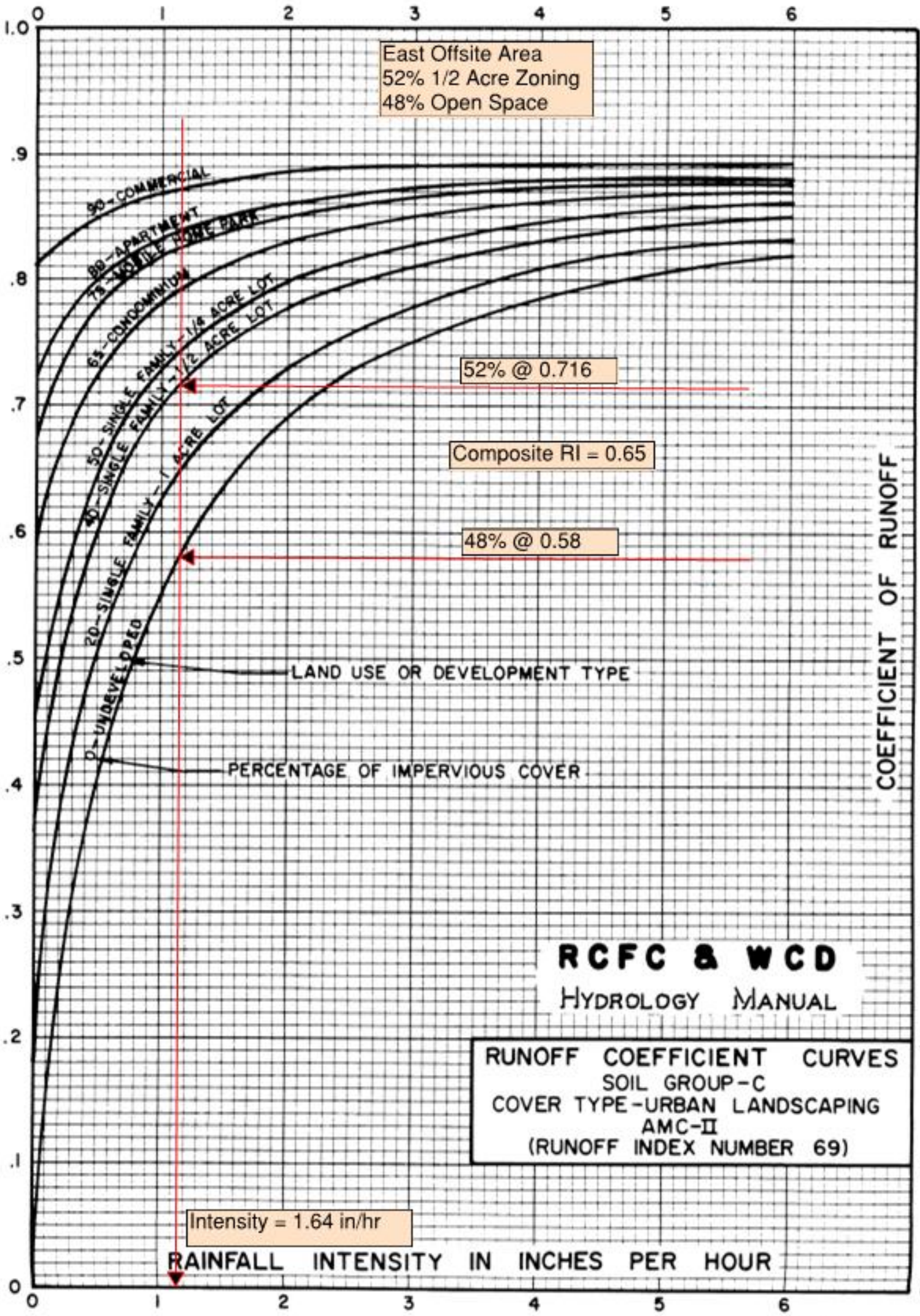

East Offsite Area
52% 1/2 Acre Zoning
48% Open Space
90-COMMERCIAL
80-APARTMENT
75-MOBILE HOME PARK
65-CONDOMINIUM
50-SINGLE FAMILY-1/4 ACRE LOT
40-SINGLE FAMILY-1/2 ACRE LOT
20-SINGLE FAMILY-1 ACRE LOT
0-UNDEVELOPED
52% @ 0.716
Composite RI = 0.65
48% @ 0.58
LAND USE OR DEVELOPMENT TYPE
PERCENTAGE OF IMPERVIOUS COVER
COEFFICIENT OF RUNOFF
Intensity = 1.64 in/hr
RAINFALL INTENSITY IN INCHES PER HOUR
RCFC & WCD
HYDROLOGY MANUAL
RUNOFF COEFFICIENT CURVES
SOIL GROUP-C
COVER TYPE-URBAN LANDSCAPING
AMC-II
(RUNOFF INDEX NUMBER 69)

PLATE D-5.3

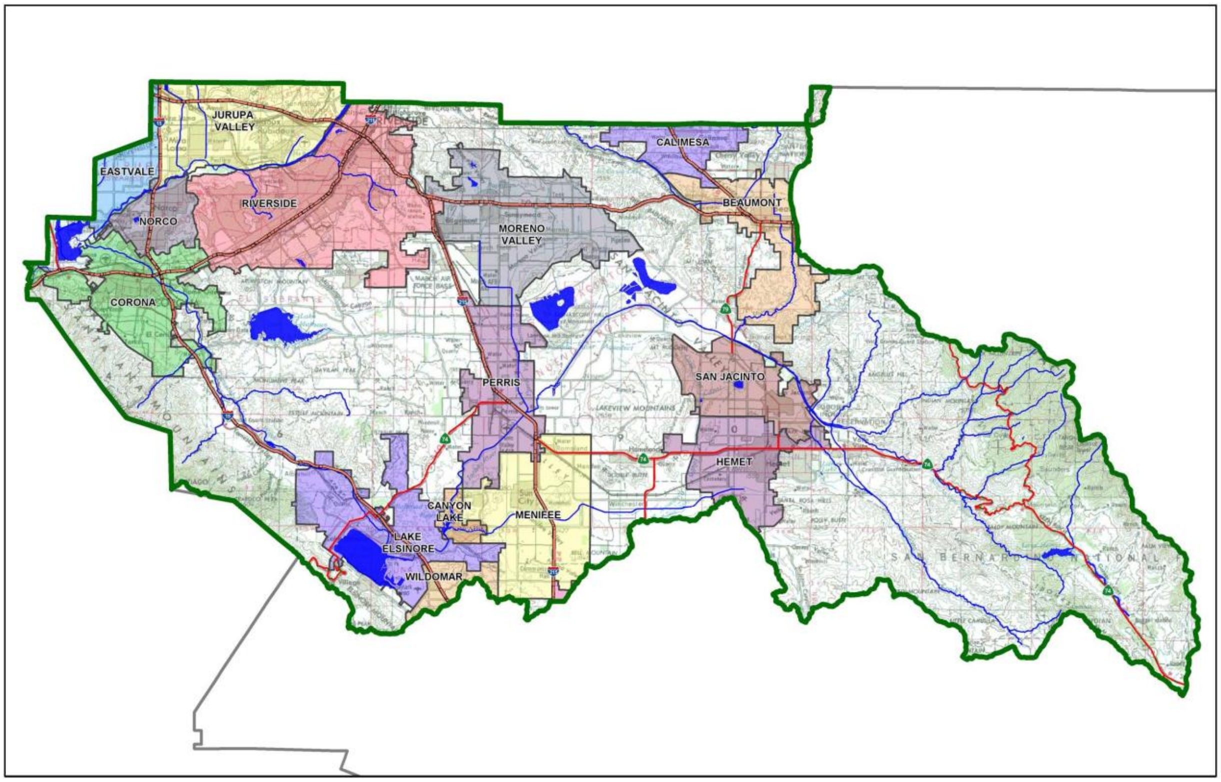
Project Specific Water Quality Management Plan

*A Template for Projects located within the **Santa Ana Watershed** Region of Riverside County*

Project Title: Enchanted Hills Park

Development No:

Design Review/Case No:



Contact Information:

Prepared for: City of Perris

Prepared by: Cvaldo Corporation

☒ **Preliminary**
☐ **Final**

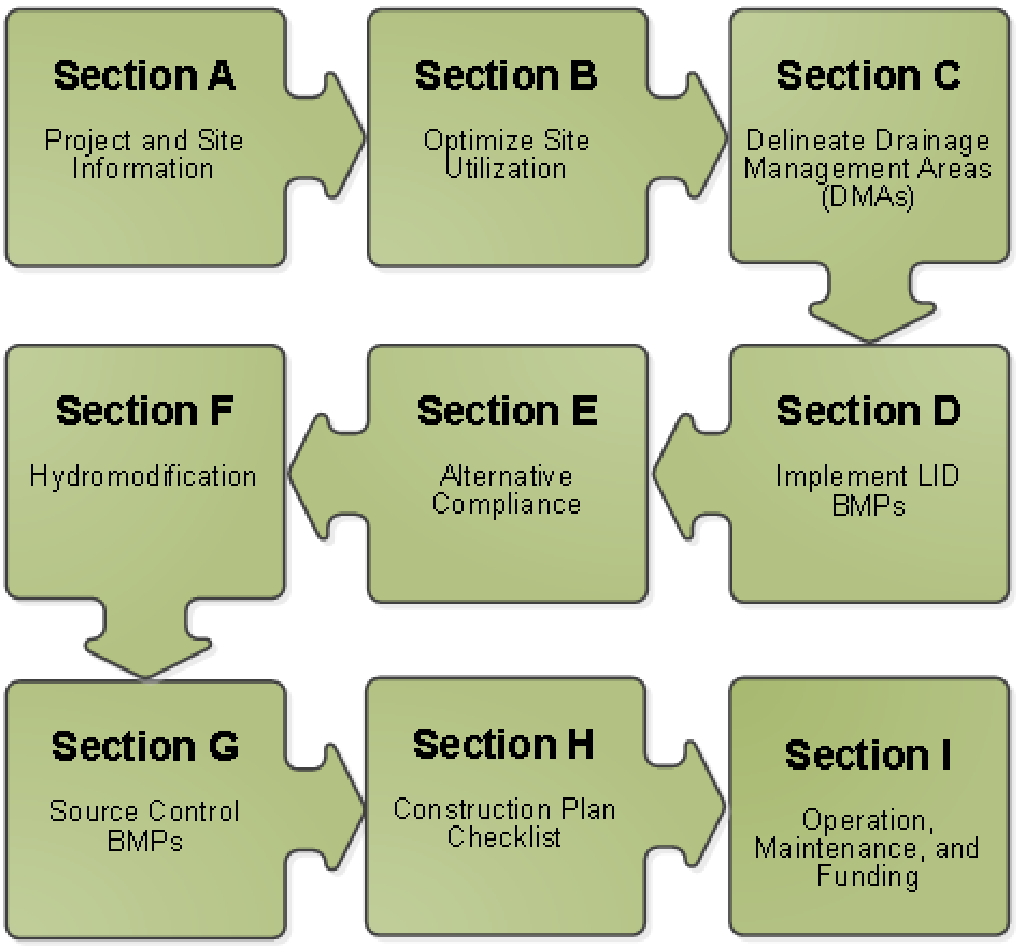
Original Date Prepared: January 10, 2020

Revision Date(s): N/A

Prepared for Compliance with
Regional Board Order No. **R8-2010-0033**

A Brief Introduction

This Project-Specific WQMP Template for the **Santa Ana Region** has been prepared to help guide you in documenting compliance for your project. Because this document has been designed to specifically document compliance, you will need to utilize the WQMP Guidance Document as your "how-to" manual to help guide you through this process. Both the Template and Guidance Document go hand-in-hand, and will help facilitate a well prepared Project-Specific WQMP. Below is a flowchart for the layout of this Template that will provide the steps required to document compliance.



OWNER'S CERTIFICATION

This Project-Specific Water Quality Management Plan (WQMP) has been prepared for The City of Perris by CValdo Corporation for the Enchanted Hills Park project.

This WQMP is intended to comply with the requirements of The City of Perris for Municipal Code Section 14.22.090 which includes the requirement for the preparation and implementation of a Project-Specific WQMP.

The undersigned, while owning the property/project described in the preceding paragraph, shall be responsible for the implementation and funding of this WQMP and will ensure that this WQMP is amended as appropriate to reflect up-to-date conditions on the site. In addition, the property owner accepts responsibility for interim operation and maintenance of Stormwater BMPs until such time as this responsibility is formally transferred to a subsequent owner. This WQMP will be reviewed with the facility operator, facility supervisors, employees, tenants, maintenance and service contractors, or any other party (or parties) having responsibility for implementing portions of this WQMP. At least one copy of this WQMP will be maintained at the project site or project office in perpetuity. The undersigned is authorized to certify and to approve implementation of this WQMP. The undersigned is aware that implementation of this WQMP is enforceable under the City of Perris Water Quality Ordinance (Municipal Code Section14.22.140).

"I, the undersigned, certify under penalty of law that the provisions of this WQMP have been reviewed and accepted and that the WQMP will be transferred to future successors in interest."

Owner's Signature

Date

Owner's Printed Name

Owner's Title/Position

PREPARER'S CERTIFICATION

"The selection, sizing and design of stormwater treatment and other stormwater quality and quantity control measures in this plan meet the requirements of Regional Water Quality Control Board Order No. **R8-2010-0033** and any subsequent amendments thereto."

Ken Horsley

Preparer's Signature

January 10, 2020

Date

Ken Horsley

Preparer's Printed Name

Project Manager

Preparer's Title/Position

Preparer's Licensure:

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List of Tables

List of Appendices

Section A: Project and Site Information

PROJECT INFORMATION		
Type of Project:	Park Site	
Planning Area:	City of Perris	
Community Name:	City of Perris	
Development Name:	Enchanted Hills Park	
PROJECT LOCATION		
Latitude & Longitude (DMS): 33°47'30.72"N, 117°15'21.95"W		
Project Watershed and Sub-Watershed: Santa Ana Watershed, San Jacinto Subwatershed		
APN(s): 326062017, 326071001 & 2, 326072001, 2, 3, 4 & 5, 326073001		
Map Book and Page No.: Insert text here		
PROJECT CHARACTERISTICS		
Proposed or Potential Land Use(s)		Park
Proposed or Potential SIC Code(s)		7999
Area of Impervious Project Footprint (SF)		* 276,024
Total Area of proposed Impervious Surfaces within the Project Limits (SF)/or Replacement		* 276,024
Does the project consist of offsite road improvements?		☐ Y ☒ N
Does the project propose to construct unpaved roads?		☐ Y ☒ N
Is the project part of a larger common plan of development (phased project)?		☐ Y ☒ N
EXISTING SITE CHARACTERISTICS		
Total area of existing Impervious Surfaces within the project limits (SF)		0
Is the project located within any MSHCP Criteria Cell?		☐ Y ☒ N
If so, identify the Cell number:		N/A
Are there any natural hydrologic features on the project site?		☒ Y ☐ N
Is a Geotechnical Report attached?		☐ Y ☒ N
If no Geotech. Report, list the NRCS soils type(s) present on the site (A, B, C and/or D)		B & C
What is the Water Quality Design Storm Depth for the project?		0.56"

A.1 Maps and Site Plans

When completing your Project-Specific WQMP, include a map of the local vicinity and existing site. In addition, include all grading, drainage, landscape/plant palette and other pertinent construction plans in Appendix 2. At a **minimum**, your WQMP Site Plan should include the following:

- Drainage Management Areas
- Proposed Structural BMPs
- Drainage Path
- Drainage Infrastructure, Inlets, Overflows
- Source Control BMPs
- Buildings, Roof Lines, Downspouts
- Impervious Surfaces
- Standard Labeling

Use your discretion on whether or not you may need to create multiple sheets or can appropriately accommodate these features on one or two sheets. Keep in mind that the Co-Permittee plan reviewer must be able to easily analyze your project utilizing this template and its associated site plans and maps.

*Can Be reduced with the use of pervious pavement

A.2 Identify Receiving Waters

Using Table A.1 below, list in order of upstream to downstream, the receiving waters that the project site is tributary to. Continue to fill each row with the Receiving Water's 303(d) listed impairments (if any), designated beneficial uses, and proximity, if any, to a RARE beneficial use. Include a map of the receiving waters in Appendix 1.

Table A.1 Identification of Receiving Waters

Receiving Waters	EPA Approved 303(d) List Impairments	Designated Beneficial Uses	Proximity to RARE Beneficial Use
Un-Named Tributary to the San Jacinto River	N/A	N/A	N/A
San Jacinto River	None	MUN, AGR, GWR, REC1, REC2, WARM, WILD	N/A
Canyon Lake	Nutrients	MUN, AGR, GWR, REC1, REC2, WARM, WILD	N/A
Lake Elsinore	Other Organics (PCBs), Nutrients, Toxicity, Pesticides	REC1, REC2, WARM, WILD	N/A

A.3 Additional Permits/Approvals required for the Project:

Table A.2 Other Applicable Permits

Agency	Permit Required	
State Department of Fish and Game, 1602 Streambed Alteration Agreement	☐ Y	☒ N
State Water Resources Control Board, Clean Water Act (CWA) Section 401 Water Quality Cert.	☐ Y	☒ N
US Army Corps of Engineers, CWA Section 404 Permit	☐ Y	☒ N
US Fish and Wildlife, Endangered Species Act Section 7 Biological Opinion	☐ Y	☒ N
Statewide Construction General Permit Coverage	☒ Y	☐ N
Statewide Industrial General Permit Coverage	☐ Y	☒ N
Western Riverside MSHCP Consistency Approval (e.g., JPR, DBESP)	☐ Y	☒ N
Other *(please list in the space below as required)*	☐ Y	☒ N

If yes is answered to any of the questions above, the Co-Permittee may require proof of approval/coverage from those agencies as applicable including documentation of any associated requirements that may affect this Project-Specific WQMP.

Section B: Optimize Site Utilization (LID Principles)

Review of the information collected in Section 'A' will aid in identifying the principal constraints on site design and selection of LID BMPs as well as opportunities to reduce imperviousness and incorporate LID Principles into the site and landscape design. For example, **constraints** might include impermeable soils, high groundwater, groundwater pollution or contaminated soils, steep slopes, geotechnical instability, high-intensity land use, heavy pedestrian or vehicular traffic, utility locations or safety concerns. **Opportunities** might include existing natural areas, low areas, oddly configured or otherwise unbuildable parcels, easements and landscape amenities including open space and buffers (which can double as locations for bioretention BMPs), and differences in elevation (which can provide hydraulic head). Prepare a brief narrative for each of the site optimization strategies described below. This narrative will help you as you proceed with your LID design and explain your design decisions to others.

The 2010 Santa Ana MS4 Permit further requires that LID Retention BMPs (Infiltration Only or Harvest and Use) be used unless it can be shown that those BMPs are infeasible. Therefore, it is important that your narrative identify and justify if there are any constraints that would prevent the use of those categories of LID BMPs. Similarly, you should also note opportunities that exist which will be utilized during project design. Upon completion of identifying Constraints and Opportunities, include these on your WQMP Site plan in Appendix 1.

Site Optimization

The following questions are based upon Section 3.2 of the WQMP Guidance Document. Review of the WQMP Guidance Document will help you determine how best to optimize your site and subsequently identify opportunities and/or constraints, and document compliance.

Did you identify and preserve existing drainage patterns? If so, how? If not, why?

Yes. The site will be graded to preserve the original points of run-on and runoff and no diversion will take place. In addition the major watercourse in the southeast portion of the site will be kept in a natural condition.

Did you identify and protect existing vegetation? If so, how? If not, why?

Yes. The site is to be developed as a park. Invasive non-native plants will be removed. Large portions of the site will be kept in a natural condition preserving any native plants.

Did you identify and preserve natural infiltration capacity? If so, how? If not, why?

Yes. It is anticipated that the existing infiltration capacity of the site will be low. However much of the site will remain in a natural condition which will allow continued infiltration.

Did you identify and minimize impervious area? If so, how? If not, why?

Yes. Approximately 72% of the site will remain in a natural condition. In addition pervious pavement may be incorporated in the final design.

Did you identify and disperse runoff to adjacent pervious areas? If so, how? If not, why?

Yes. The site grading will allow runoff from much of the paved areas to flow into the landscaped or natural portions of the site.

Section C: Delineate Drainage Management Areas (DMAs)

Utilizing the procedure in Section 3.3 of the WQMP Guidance Document which discusses the methods of delineating and mapping your project site into individual DMAs, complete Table C.1 below to appropriately categorize the types of classification (e.g., Type A, Type B, etc.) per DMA for your project site. Upon completion of this table, this information will then be used to populate and tabulate the corresponding tables for their respective DMA classifications.

Table C.1 DMA Classifications

DMA Name or ID	Surface Type(s)[1]	Area (Sq. Ft.)	DMA Type
DMA 1	Mixed,	7,497,617	Type A onsite, with addition of offsite bypass flows
DMA 2	Concrete, roofs, Park use with type B and C soils	823,204	Type D

[1]*Reference Table 2-1 in the WQMP Guidance Document to populate this column*

Table C.2 Type 'A', Self-Treating Areas

DMA Name or ID	Area (Sq. Ft.)	Stabilization Type	Irrigation Type (if any)
Onsite Portion of DMA 1	104,683	Natural Vegetation	N/A

Table C.3 Type 'B', Self-Retaining Areas (N/A)

Self-Retaining Area				Type 'C' DMAs that are draining to the Self-Retaining Area		
DMA Name/ ID	Post-project surface type	Area (square feet) [A]	Storm Depth (inches) [B]	DMA Name / ID	[C] from Table C.4 = [C]	Required Retention Depth (inches) [D]
N/A						

$$[D] = [B] + \frac{[B] \cdot [C]}{[A]}$$

Table C.4 Type 'C', Areas that Drain to Self-Retaining Areas (N/A)

DMA					**Receiving Self-Retaining DMA**		
DMA Name/ ID	Area (square feet)	Post-project surface type	Runoff factor	Product	DMA name /ID	Area (square feet)	Ratio
	[A]		[B]	[C] = [A] x [B]		[D]	[C]/[D]
N/A							

Table C.5 Type 'D', Areas Draining to BMPs

DMA Name or ID	BMP Name or ID
DMA 2	Basin 1

Note: More than one drainage management area can drain to a single LID BMP, however, one drainage management area may not drain to more than one BMP.

Section D: Implement LID BMPs

D.1 Infiltration Applicability

Is there an approved downstream 'Highest and Best Use' for stormwater runoff (see discussion in Chapter 2.4.4 of the WQMP Guidance Document for further details)? ☐ Y ☒ N

(It is noted that Lake Elsinore is evaporating faster than natural precipitation can recharge it. However no revision to LID requirements in the watershed has been approved.) If yes has been checked, Infiltration BMPs shall not be used for the site. If no, continue working through this section to implement your LID BMPs. It is recommended that you contact your Co-Permittee to verify whether or not your project discharges to an approved downstream 'Highest and Best Use' feature.

Geotechnical Report

A Geotechnical Report or Phase I Environmental Site Assessment may be required by the Copermittee to confirm present and past site characteristics that may affect the use of Infiltration BMPs. In addition, the Co-Permittee, at their discretion, may not require a geotechnical report for small projects as described in Chapter 2 of the WQMP Guidance Document. If a geotechnical report has been prepared, include it in Appendix 3. In addition, if a Phase I Environmental Site Assessment has been prepared, include it in Appendix 4.

Is this project classified as a small project consistent with the requirements of Chapter 2 of the WQMP Guidance Document? ☐ Y ☒ N

Infiltration Feasibility

Table D.1 below is meant to provide a simple means of assessing which DMAs on your site support Infiltration BMPs and is discussed in the WQMP Guidance Document in Chapter 2.4.5. Check the appropriate box for each question and then list affected DMAs as applicable. If additional space is needed, add a row below the corresponding answer.

Table D.1 Infiltration Feasibility
*(Table D.1 is not being used as a soils report has not been prepared and this is a Preliminary WQMP)

Does the project site…	YES	NO
…have any DMAs with a seasonal high groundwater mark shallower than 10 feet?	*	*
If Yes, list affected DMAs:	*	*
…have any DMAs located within 100 feet of a water supply well?	*	*
If Yes, list affected DMAs:	*	*
…have any areas identified by the geotechnical report as posing a public safety risk where infiltration of stormwater could have a negative impact?	*	*
If Yes, list affected DMAs:	*	*
…have measured in-situ infiltration rates of less than 1.6 inches / hour?	*	*
If Yes, list affected DMAs:	*	*
…have significant cut and/or fill conditions that would preclude in-situ testing of infiltration rates at the final infiltration surface?	*	*
If Yes, list affected DMAs:	*	*
…geotechnical report identify other site-specific factors that would preclude effective and safe infiltration?	*	*
Describe here:	*	*

If you answered "Yes" to any of the questions above for any DMA, Infiltration BMPs should not be used for those DMAs and you should proceed to the assessment for Harvest and Use below.

D.2 Harvest and Use Assessment

Please check what applies*:*

- ✓ *Reclaimed water will be used for the non-potable water demands for the project.
- ☐ Downstream water rights may be impacted by Harvest and Use as approved by the Regional Board (verify with the Copermittee).
- ☐ The Design Capture Volume will be addressed using Infiltration Only BMPs. In such a case, Harvest and Use BMPs are still encouraged, but it would not be required if the Design Capture Volume will be infiltrated or evapotranspired.

If any of the above boxes have been checked, <u>Harvest and Use BMPs need not be assessed for the site</u>. If neither of the above criteria applies, follow the steps below to assess the feasibility of irrigation use, toilet use and other non-potable uses (e.g., industrial use).

<u>The use of reclaimed water is an assumption. If reclaimed water is not available in the area, the harvest and use portion of the WQMP can be completed when the Final WQMP is done.</u>

Irrigation Use Feasibility (N/A)

Complete the following steps to determine the feasibility of harvesting stormwater runoff for Irrigation Use BMPs on your site:

Step 1: Identify the total area of irrigated landscape on the site, and the type of landscaping used.

Total Area of Irrigated Landscape: Insert Area (Acres)

Type of Landscaping (Conservation Design or Active Turf): List Landscaping Type

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for irrigation use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: Insert Area (Acres)

Step 3: Cross reference the Design Storm depth for the project site (see Exhibit A of the WQMP Guidance Document) with the left column of Table 2-3 in Chapter 2 to determine the minimum area of Effective Irrigated Area per Tributary Impervious Area (EIATIA).

Enter your EIATIA factor: EIATIA Factor

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum irrigated area that would be required.

Minimum required irrigated area: Insert Area (Acres)

Step 5: Determine if harvesting stormwater runoff for irrigation use is feasible for the project by comparing the total area of irrigated landscape (Step 1) to the minimum required irrigated area (Step 4).

Minimum required irrigated area (Step 4)	Available Irrigated Landscape (Step 1)
Insert Area (Acres)	Insert Area (Acres)

Toilet Use Feasibility (N/A)

Complete the following steps to determine the feasibility of harvesting stormwater runoff for toilet flushing uses on your site:

Step 1: Identify the projected total number of daily toilet users during the wet season, and account for any periodic shut downs or other lapses in occupancy:

Projected Number of Daily Toilet Users: Number of daily Toilet Users

Project Type: Enter 'Residential', 'Commercial', 'Industrial' or 'Schools'

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for toilet use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: Insert Area (Acres)

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-1 in Chapter 2 to determine the minimum number or toilet users per tributary impervious acre (TUTIA).

Enter your TUTIA factor: TUTIA Factor

Step 4: Multiply the unit value obtained from Step 3 by the total of impervious areas from Step 2 to develop the minimum number of toilet users that would be required.

Minimum number of toilet users: Required number of toilet users

Step 5: Determine if harvesting stormwater runoff for toilet flushing use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required Toilet Users (Step 4)	**Projected number of toilet users (Step 1)**
Insert Area (Acres)	Insert Area (Acres)

Other Non-Potable Use Feasibility (N/A)

Are there other non-potable uses for stormwater runoff on the site (e.g. industrial use)? See Chapter 2 of the Guidance for further information. If yes, describe below. If no, write N/A.

Insert narrative description here.

Step 1: Identify the projected average daily non-potable demand, in gallons per day, during the wet season and accounting for any periodic shut downs or other lapses in occupancy or operation.

Average Daily Demand: Projected Average Daily Use (gpd)

Step 2: Identify the planned total of all impervious areas on the proposed project from which runoff might be feasibly captured and stored for the identified non-potable use. Depending on the configuration of buildings and other impervious areas on the site, you may consider the site as a whole, or parts of the site, to evaluate reasonable scenarios for capturing and storing runoff and directing the stored runoff to the potential use(s) identified in Step 1 above.

Total Area of Impervious Surfaces: Insert Area (Acres)

Step 3: Enter the Design Storm depth for the project site (see Exhibit A) into the left column of Table 2-3 in Chapter 2 to determine the minimum demand for non-potable uses per tributary impervious acre.

Enter the factor from Table 2-3: Enter Value

Step 4: Multiply the unit value obtained from Step 4 by the total of impervious areas from Step 3 to develop the minimum number of gallons per day of non-potable use that would be required.

Minimum required use: Minimum use required (gpd)

Step 5: Determine if harvesting stormwater runoff for other non-potable use is feasible for the project by comparing the Number of Daily Toilet Users (Step 1) to the minimum required number of toilet users (Step 4).

Minimum required non-potable use (Step 4)	**Projected average daily use (Step 1)**
Minimum use required (gpd)	Projected Average Daily Use (gpd)

If Irrigation, Toilet and Other Use feasibility anticipated demands are less than the applicable minimum values, Harvest and Use BMPs are not required and you should proceed to utilize LID Bioretention and Biotreatment, unless a site-specific analysis has been completed that demonstrates technical infeasibility as noted in D.3 below.

D.3 Bioretention and Biotreatment Assessment

Other LID Bioretention and Biotreatment BMPs as described in Chapter 2.4.7 of the WQMP Guidance Document are feasible on nearly all development sites with sufficient advance planning.

Select one of the following:

- ✓ LID Bioretention/Biotreatment BMPs will be used for some or all DMAs of the project as noted below in Section D.4 (note the requirements of Section 3.4.2 in the WQMP Guidance Document).
- ☐ A site-specific analysis demonstrating the technical infeasibility of all LID BMPs has been performed and is included in Appendix 5. If you plan to submit an analysis demonstrating the technical infeasibility of LID BMPs, request a pre-submittal meeting with the Copermittee to discuss this option. Proceed to Section E to document your alternative compliance measures.

D.4 Feasibility Assessment Summaries

From the Infiltration, Harvest and Use, Bioretention and Biotreatment Sections above, complete Table D.2 below to summarize which LID BMPs are technically feasible, and which are not, based upon the established hierarchy.

Table D.2 LID Prioritization Summary Matrix

DMA Name/ID	LID BMP Hierarchy				No LID (Alternative Compliance)*
	1. Infiltration	2. Harvest and use	3. Bioretention	4. Biotreatment	
DMA 1	☐	☐	☐	☐	☒
DMA 2	☐	☐	☒	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐

For those DMAs where LID BMPs are not feasible, provide a brief narrative below summarizing why they are not feasible, include your technical infeasibility criteria in Appendix 5, and proceed to Section E below to document Alternative Compliance measures for those DMAs. Recall that each proposed DMA must pass through the LID BMP hierarchy before alternative compliance measures may be considered.

* DMA 1 consists primarily of offsite flows that will discharge to a self treating riparian area located in the southeast portion of the site. It is recommended that the portion of the offsite flows entering the site from the north be conveyed directly to the riparian area via an underground storm drain system. This will prevent mixing with flows from developed portions of the site. Since the offsite flows are considered to be pass-through, and will not mix with any flows from developed portions of the site, no BMP is necessary for DMA 1. Technical infeasibility criteria will not be required in Appendix 5.

D.5 LID BMP Sizing

Each LID BMP must be designed to ensure that the Design Capture Volume will be addressed by the selected BMPs. First**,** calculate the Design Capture Volume for each LID BMP using the V_{BMP} worksheet in Appendix F of the LID BMP Design Handbook. Second**,** design the LID BMP to meet the required V_{BMP} using a method approved by the Copermittee. Utilize the worksheets found in the LID BMP Design Handbook or consult with your Copermittee to assist you in correctly sizing your LID BMPs. Complete Table D.3 below to document the Design Capture Volume and the Proposed Volume for each LID BMP. Provide the completed design procedure sheets for each LID BMP in Appendix 6. You may add additional rows to the table below as needed.

Table D.3 DCV Calculations for LID BMPs

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]	*Design Storm Depth (in)*	*Design Capture Volume,* V_{BMP} *(cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA 2	*276,024*	*Roofs / Pavement*	*1.00*	*0.892*	*246,213*			
	437,744	*Type C Soil*	*0.30*	*0.23*	*98,565*			
	109,436	*Type B Soil*	*0.15*	*0.14*	*15,479*			
	823,204				360257	0.56	16,812	20,000

[B], [C] is obtained as described in Section 2.3.1 of the WQMP Guidance Document

[E] is obtained from Exhibit A in the WQMP Guidance Document

[G] is obtained from a design procedure sheet, such as in LID BMP Design Handbook and placed in Appendix 6

Section E: Alternative Compliance (LID Waiver Program)

LID BMPs are expected to be feasible on virtually all projects. Where LID BMPs have been demonstrated to be infeasible as documented in Section D, other Treatment Control BMPs must be used (subject to LID waiver approval by the Copermittee). Check one of the following Boxes:

☐ LID Principles and LID BMPs have been incorporated into the site design to fully address all Drainage Management Areas. No alternative compliance measures are required for this project and thus this Section is not required to be completed.

- *Or* -

☐ The following Drainage Management Areas are unable to be addressed using LID BMPs. A site-specific analysis demonstrating technical infeasibility of LID BMPs has been approved by the Co-Permittee and included in Appendix 5. Additionally, no downstream regional and/or sub-regional LID BMPs exist or are available for use by the project. The following alternative compliance measures on the following pages are being implemented to ensure that any pollutant loads expected to be discharged by not incorporating LID BMPs, are fully mitigated.

List DMAs here.

E.1 Identify Pollutants of Concern

Utilizing Table A.1 from Section A above which noted your project's receiving waters and their associated EPA approved 303(d) listed impairments, cross reference this information with that of your selected Priority Development Project Category in Table E.1 below. If the identified General Pollutant Categories are the same as those listed for your receiving waters, then these will be your Pollutants of Concern and the appropriate box or boxes will be checked on the last row. The purpose of this is to document compliance and to help you appropriately plan for mitigating your Pollutants of Concern in lieu of implementing LID BMPs.

Table E.1 Potential Pollutants by Land Use Type

Priority Development Project Categories and/or Project Features (check those that apply)	General Pollutant Categories							
	Bacterial Indicators	Metals	Nutrients	Pesticides	Toxic Organic Compounds	Sediments	Trash & Debris	Oil & Grease
☐ Detached Residential Development	P	N	P	P	N	P	P	P
☐ Attached Residential Development	P	N	P	P	N	P	P	P(2)
☐ Commercial/Industrial Development	P(3)	P	P(1)	P(1)	P(5)	P(1)	P	P
☐ Automotive Repair Shops	N	P	N	N	P(4, 5)	N	P	P
☐ Restaurants (>5,000 ft^2)	P	N	N	N	N	N	P	P
☐ Hillside Development (>5,000 ft^2)	P	N	P	P	N	P	P	P
☐ Parking Lots (>5,000 ft^2)	P(6)	P	P(1)	P(1)	P(4)	P(1)	P	P
☐ Retail Gasoline Outlets	N	P	N	N	P	N	P	P
Project Priority Pollutant(s) of Concern	☐	☐	☐	☐	☐	☐	☐	☐

P = Potential

N = Not Potential

(1) A potential Pollutant if non-native landscaping exists or is proposed onsite; otherwise not expected

(2) A potential Pollutant if the project includes uncovered parking areas; otherwise not expected

(3) A potential Pollutant is land use involving animal waste

(4) Specifically petroleum hydrocarbons

(5) Specifically solvents

(6) Bacterial indicators are routinely detected in pavement runoff

E.2 Stormwater Credits

Projects that cannot implement LID BMPs but nevertheless implement smart growth principles are potentially eligible for Stormwater Credits. Utilize Table 3-8 within the WQMP Guidance Document to identify your Project Category and its associated Water Quality Credit. If not applicable, write N/A.

Table E.2 Water Quality Credits

Qualifying Project Categories	Credit Percentage[2]
Total Credit Percentage[1]	

[1]Cannot Exceed 50%
[2]Obtain corresponding data from Table 3-8 in the WQMP Guidance Document

E.3 Sizing Criteria

After you appropriately considered Stormwater Credits for your project, utilize Table E.3 below to appropriately size them to the DCV, or Design Flow Rate, as applicable. Please reference Chapter 3.5.2 of the WQMP Guidance Document for further information.

Table E.3 Treatment Control BMP Sizing

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Impervious Fraction, I_f	DMA Runoff Factor	DMA Area x Runoff Factor		*Enter BMP Name / Identifier Here*		
	[A]		[B]	[C]	[A] x [C]				
						Design Storm Depth (in)	*Minimum Design Capture Volume or Design Flow Rate (cubic feet or cfs)*	*Total Storm Water Credit % Reduction*	*Proposed Volume or Flow on Plans (cubic feet or cfs)*
	$A_T = \Sigma[A]$				$\Sigma = [D]$	[E]	$[F] = \frac{[D]x[E]}{[G]}$	[F] X (1-[H])	[I]

[B], [C] is obtained as described in Section 2.3.1 from the WQMP Guidance Document
[E] is obtained from Exhibit A in the WQMP Guidance Document
[G] is for Flow-Based Treatment Control BMPs [G] = 43,560, for Volume-Based Control Treatment BMPs, [G] = 12
[H] is from the Total Credit Percentage as Calculated from Table E.2 above
[I] as obtained from a design procedure sheet from the BMP manufacturer and should be included in Appendix 6

E.4 Treatment Control BMP Selection

Treatment Control BMPs typically provide proprietary treatment mechanisms to treat potential pollutants in runoff, but do not sustain significant biological processes. Treatment Control BMPs must have a removal efficiency of a medium or high effectiveness as quantified below:

- **High**: equal to or greater than 80% removal efficiency
- **Medium**: between 40% and 80% removal efficiency

Such removal efficiency documentation (e.g., studies, reports, etc.) as further discussed in Chapter 3.5.2 of the WQMP Guidance Document, must be included in Appendix 6. In addition, ensure that proposed Treatment Control BMPs are properly identified on the WQMP Site Plan in Appendix 1.

Table E.4 Treatment Control BMP Selection

Selected Treatment Control BMP Name or ID[1]	Priority Pollutant(s) of Concern to Mitigate[2]	Removal Efficiency Percentage[3]

[1] Treatment Control BMPs must not be constructed within Receiving Waters. In addition, a proposed Treatment Control BMP may be listed more than once if they possess more than one qualifying pollutant removal efficiency.
[2] Cross Reference Table E.1 above to populate this column.
[3] As documented in a Co-Permittee Approved Study and provided in Appendix 6.

Section F: Hydromodification

F.1 Hydrologic Conditions of Concern (HCOC) Analysis

Once you have determined that the LID design is adequate to address water quality requirements, you will need to assess if the proposed LID Design may still create a HCOC. Review Chapters 2 and 3 (including Figure 3-7) of the WQMP Guidance Document to determine if your project must mitigate for Hydromodification impacts. If your project meets one of the following criteria which will be indicated by the check boxes below, you do not need to address Hydromodification at this time. However, if the project does not qualify for Exemptions 1, 2 or 3, then additional measures must be added to the design to comply with HCOC criteria. This is discussed in further detail below in Section F.2.

HCOC EXEMPTION 1: The Priority Development Project disturbs less than one acre. The Copermittee has the discretion to require a Project-Specific WQMP to address HCOCs on projects less than one acre on a case by case basis. The disturbed area calculation should include all disturbances associated with larger common plans of development.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply.

HCOC EXEMPTION 2: The volume and time of concentration[1] of storm water runoff for the post-development condition is not significantly different from the pre-development condition for a 2-year return frequency storm (a difference of 5% or less is considered insignificant) using one of the following methods to calculate:

- Riverside County Hydrology Manual
- Technical Release 55 (TR-55): Urban Hydrology for Small Watersheds (NRCS 1986), or derivatives thereof, such as the Santa Barbara Urban Hydrograph Method
- Other methods acceptable to the Co-Permittee

Does the project qualify for this HCOC Exemption? ☒ Y ☐ N

If Yes, report results in Table F.1 below and provide your substantiated hydrologic analysis in Appendix 7.

Table F.1 Hydrologic Conditions of Concern Summary

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	13.46 Hours	13.42 Hours	2.97%
Volume (Cubic Feet)	49,204	49,395	3.88%

[1] Time of concentration is defined as the time after the beginning of the rainfall when all portions of the drainage basin are contributing to flow at the outlet. (Time to Peak Flow Rate)

HCOC EXEMPTION 3: All downstream conveyance channels to an adequate sump (for example, Prado Dam, Lake Elsinore, Canyon Lake, Santa Ana River, or other lake, reservoir or naturally erosion resistant feature) that will receive runoff from the project are engineered and regularly maintained to ensure design flow capacity; no sensitive stream habitat areas will be adversely affected; or are not identified on the Co-Permittees Hydromodification Sensitivity Maps.

Does the project qualify for this HCOC Exemption? ☐ Y ☒ N

If Yes, HCOC criteria do not apply and note below which adequate sump applies to this HCOC qualifier:

INSERT TEXT HERE

F.2 HCOC Mitigation

If none of the above HCOC Exemption Criteria are applicable, HCOC criteria is considered mitigated if they meet one of the following conditions:

a. Additional LID BMPS are implemented onsite or offsite to mitigate potential erosion or habitat impacts as a result of HCOCs. This can be conducted by an evaluation of site-specific conditions utilizing accepted professional methodologies published by entities such as the California Stormwater Quality Association (CASQA), the Southern California Coastal Water Research Project (SCCRWP), or other Co-Permittee approved methodologies for site-specific HCOC analysis.

b. The project is developed consistent with an approved Watershed Action Plan that addresses HCOC in Receiving Waters.

c. Mimicking the pre-development hydrograph with the post-development hydrograph, for a 2-year return frequency storm. Generally, the hydrologic conditions of concern are not significant, if the post-development hydrograph is no more than 10% greater than pre-development hydrograph. In cases where excess volume cannot be infiltrated or captured and reused, discharge from the site must be limited to a flow rate no greater than 110% of the pre-development 2-year peak flow.

Be sure to include all pertinent documentation used in your analysis of the items a, b or c in Appendix 7.

Section G: Source Control BMPs

Source control BMPs include permanent, structural features that may be required in your project plans — such as roofs over and berms around trash and recycling areas — and Operational BMPs, such as regular sweeping and "housekeeping", that must be implemented by the site's occupant or user. The MEP standard typically requires both types of BMPs. In general, Operational BMPs cannot be substituted for a feasible and effective permanent BMP. Using the Pollutant Sources/Source Control Checklist in Appendix 8, review the following procedure to specify Source Control BMPs for your site:

1. ***Identify Pollutant Sources***: Review Column 1 in the Pollutant Sources/Source Control Checklist. Check off the potential sources of Pollutants that apply to your site.

2. ***Note Locations on Project-Specific WQMP Exhibit***: Note the corresponding requirements listed in Column 2 of the Pollutant Sources/Source Control Checklist. Show the location of each Pollutant source and each permanent Source Control BMP in your Project-Specific WQMP Exhibit located in Appendix 1.

3. ***Prepare a Table and Narrative***: Check off the corresponding requirements listed in Column 3 in the Pollutant Sources/Source Control Checklist. In the left column of Table G.1 below, list each potential source of runoff Pollutants on your site (from those that you checked in the Pollutant Sources/Source Control Checklist). In the middle column, list the corresponding permanent, Structural Source Control BMPs (from Columns 2 and 3 of the Pollutant Sources/Source Control Checklist) used to prevent Pollutants from entering runoff. **Add additional narrative** in this column that explains any special features, materials or methods of construction that will be used to implement these permanent, Structural Source Control BMPs.

4. ***Identify Operational Source Control BMPs:*** To complete your table, refer once again to the Pollutant Sources/Source Control Checklist. List in the right column of your table the Operational BMPs that should be implemented as long as the anticipated activities continue at the site. Copermittee stormwater ordinances require that applicable Source Control BMPs be implemented; the same BMPs may also be required as a condition of a use permit or other revocable Discretionary Approval for use of the site.

Table G.1 Permanent and Operational Source Control Measures

Potential Sources of Runoff pollutants	Permanent Structural Source Control BMPs	Operational Source Control BMPs
Storm Drain Inlets	Stencil Inlets	Inlet Cleaning and repaint stenciling when necessary
Landscape Pesticide Use	Design landscaping to minimize runoff	Use minimum amount of pesticide
Refuse Areas	Signage restricting hazardous materials. Provide covers for all receptacles.	Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous

		materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site.
Plazas, sidewalks, and parking lots.		Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.

Section H: Construction Plan Checklist

Populate Table H.1 below to assist the plan checker in an expeditious review of your project. The first two columns will contain information that was prepared in previous steps, while the last column will be populated with the corresponding plan sheets. This table is to be completed with the submittal of your final Project-Specific WQMP.

Table H.1 Construction Plan Cross-reference (N/A, this table will be filled out with the Final WQMP)

BMP No. or ID	BMP Identifier and Description	Corresponding Plan Sheet(s)

Note that the updated table — or Construction Plan WQMP Checklist — is **only a reference tool** to facilitate an easy comparison of the construction plans to your Project-Specific WQMP. Co-Permittee staff can advise you regarding the process required to propose changes to the approved Project-Specific WQMP.

Section I: Operation, Maintenance and Funding

The Copermittee will periodically verify that Stormwater BMPs on your site are maintained and continue to operate as designed. To make this possible, your Copermittee will require that you include in Appendix 9 of this Project-Specific WQMP:

1. A means to finance and implement facility maintenance in perpetuity, including replacement cost.
2. Acceptance of responsibility for maintenance from the time the BMPs are constructed until responsibility for operation and maintenance is legally transferred. A warranty covering a period following construction may also be required.
3. An outline of general maintenance requirements for the Stormwater BMPs you have selected.
4. Figures delineating and designating pervious and impervious areas, location, and type of Stormwater BMP, and tables of pervious and impervious areas served by each facility. Geo-locating the BMPs using a coordinate system of latitude and longitude is recommended to help facilitate a future statewide database system.
5. A separate list and location of self-retaining areas or areas addressed by LID Principles that do not require specialized O&M or inspections but will require typical landscape maintenance as noted in Chapter 5, pages 85-86, in the WQMP Guidance. Include a brief description of typical landscape maintenance for these areas.

Your local Co-Permittee will also require that you prepare and submit a detailed Stormwater BMP Operation and Maintenance Plan that sets forth a maintenance schedule for each of the Stormwater BMPs built on your site. An agreement assigning responsibility for maintenance and providing for inspections and certification may also be required.

Details of these requirements and instructions for preparing a Stormwater BMP Operation and Maintenance Plan are in Chapter 5 of the WQMP Guidance Document.

Maintenance Mechanism: It is assumed that the City of Perris will maintain the park. However the actual maintenance mechanism will be determined with the Final WQMP.

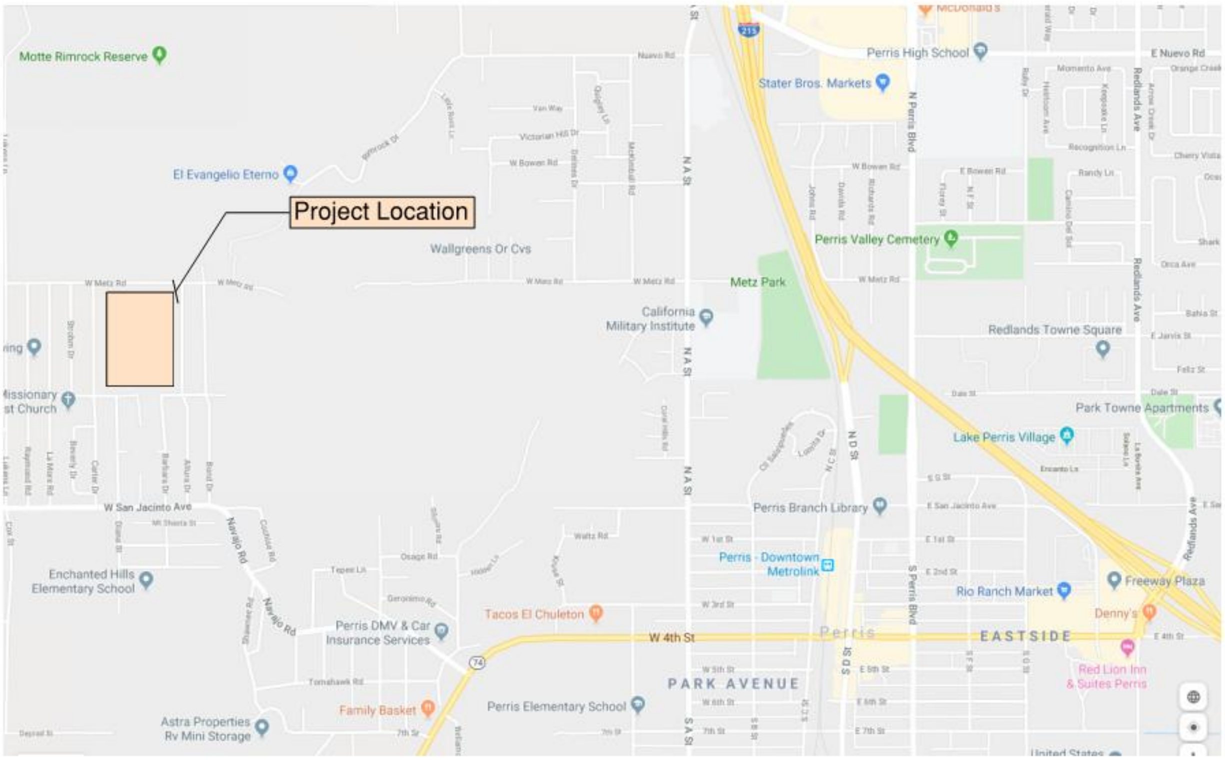
Will the proposed BMPs be maintained by a Home Owners' Association (HOA) or Property Owners Association (POA)?

☐ Y ☒ N

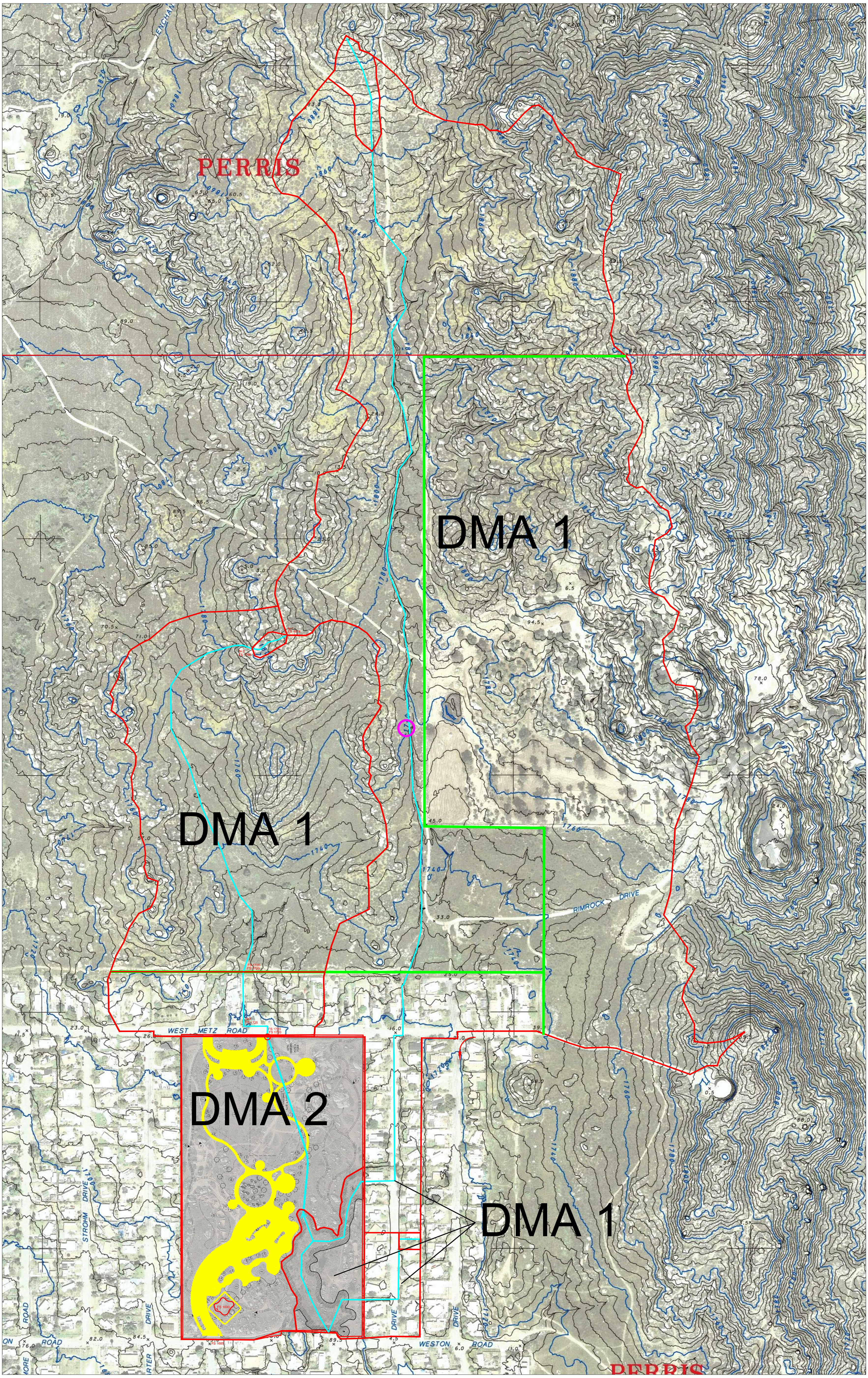
Include your Operation and Maintenance Plan and Maintenance Mechanism in Appendix 9. Additionally, include all pertinent forms of educational materials for those personnel that will be maintaining the proposed BMPs within this Project-Specific WQMP in Appendix 10.

Appendix 1: Maps and Site Plans

Location Map, WQMP Site Plan and Receiving Waters Map

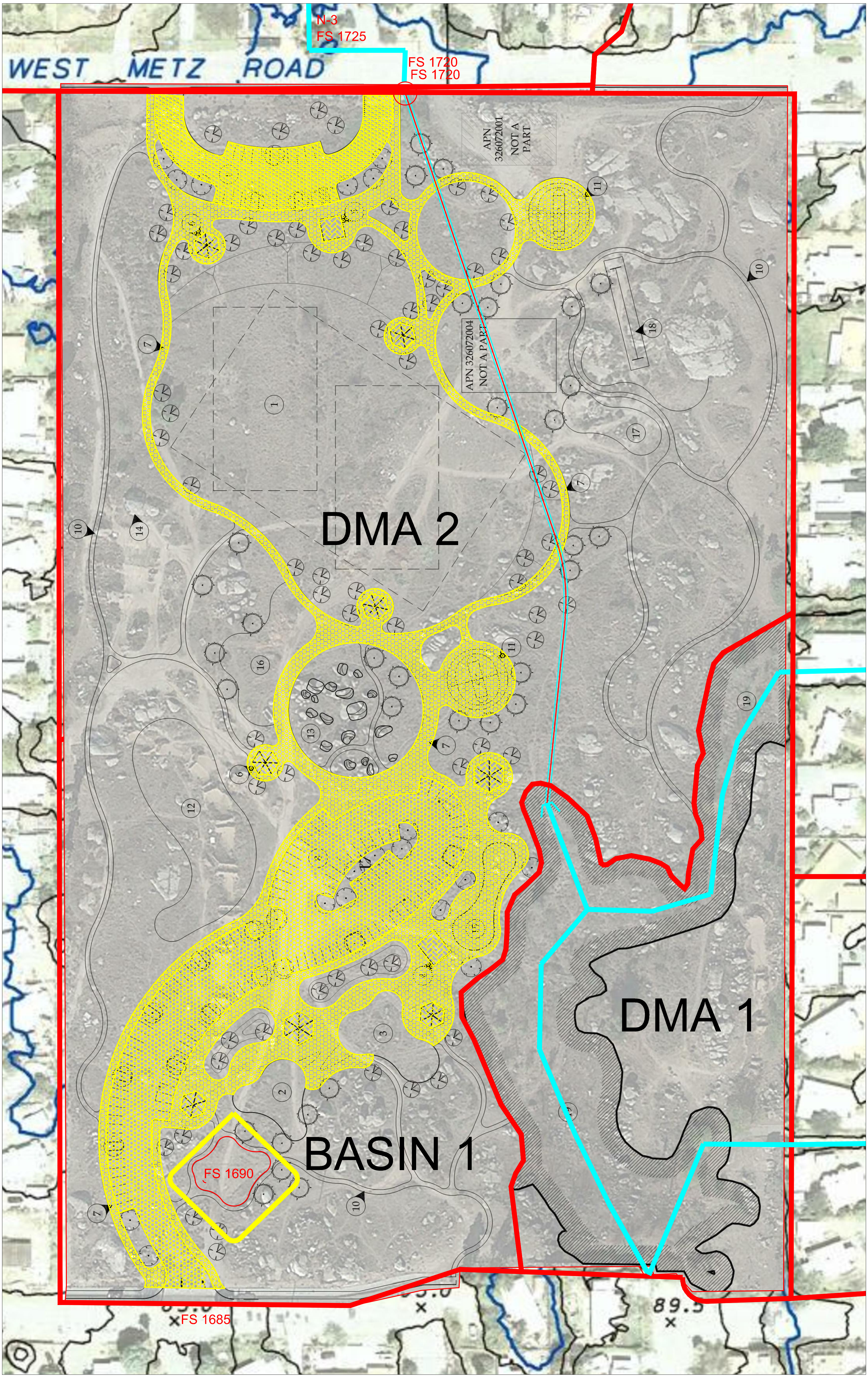


Vicinity Map



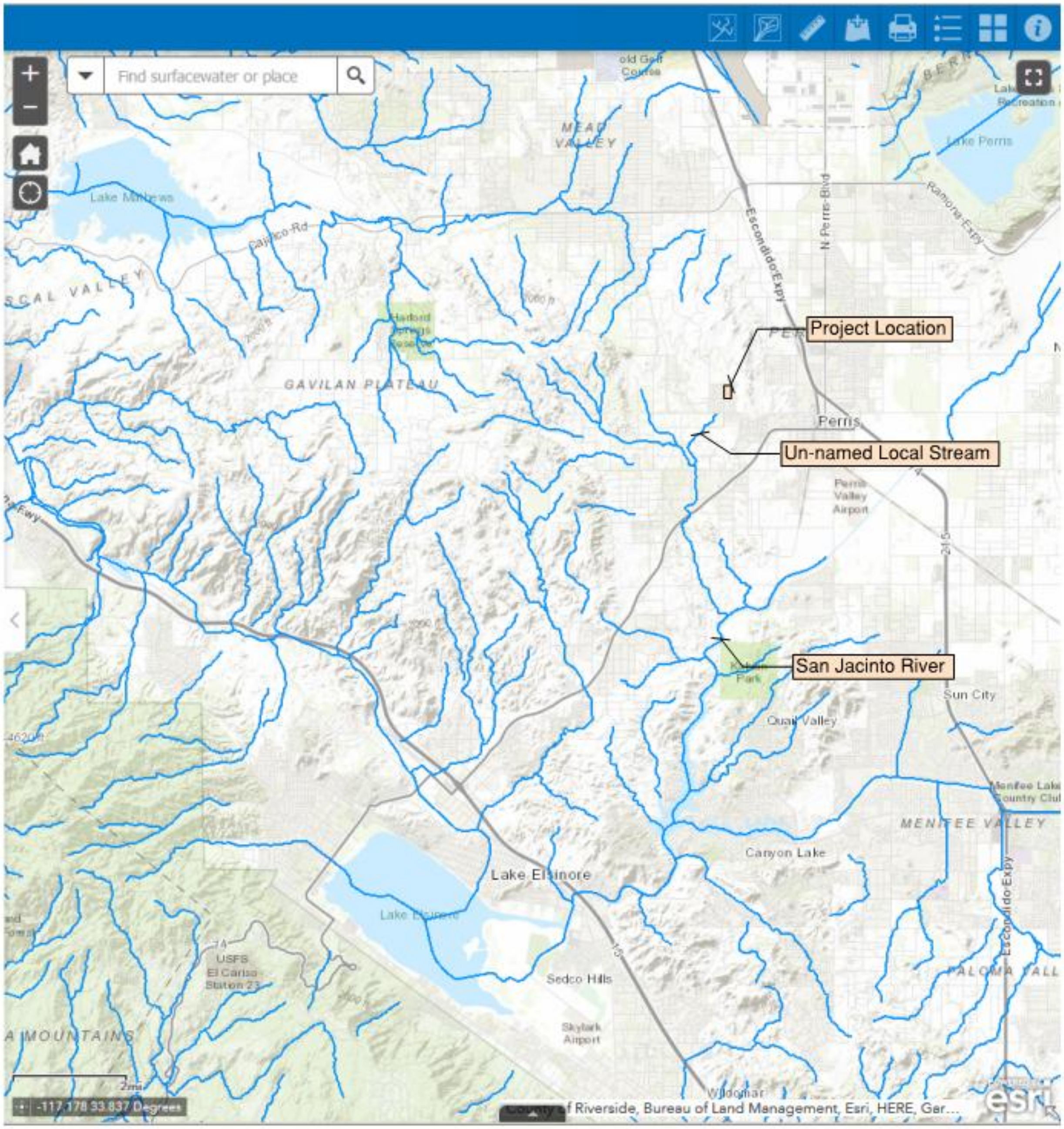
WQMP SITE PLAN (1 of 2)

1"=400'



WQMP SITE PLAN (2 of 2)

1"=100'

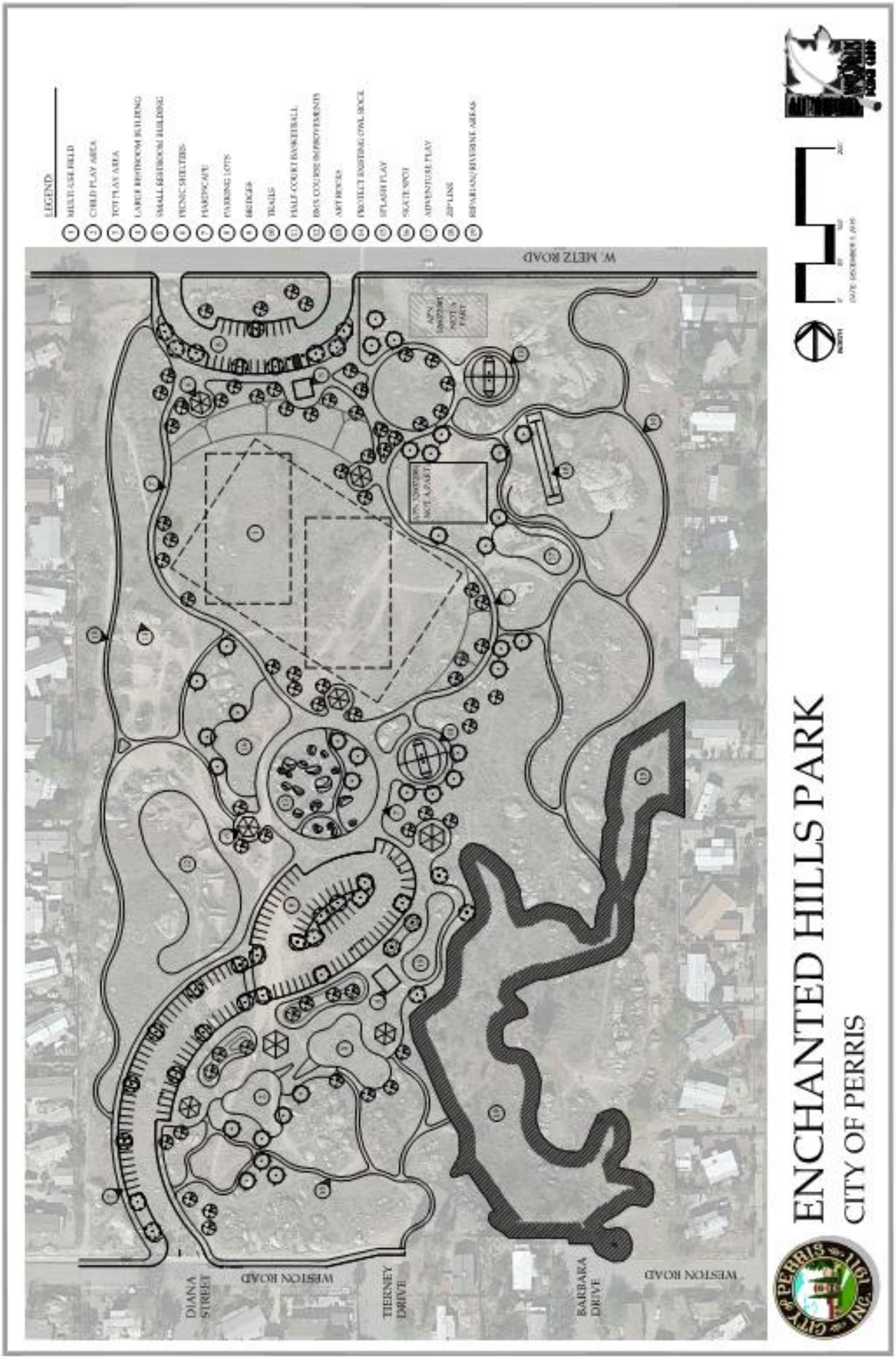


Receiving Waters Map

Appendix 2: Construction Plans

Grading and Drainage Plans

Conceptual Plan is provided for the Preliminary WQMP. Construction drawings will be provided with the Final WQMP.



LEGEND
1 MULTI-USE FIELD
2 CHILD PLAY AREA
3 TOT PLAY AREA
4 LARGE RESTROOM BUILDING
5 SMALL RESTROOM BUILDING
6 PICNIC SHELTERS
7 HARDSCAPE
8 PARKING LOTS
9 BRIDGES
10 TRAILS
11 HALF-COURT BASKETBALL
12 BMX COURSE IMPROVEMENTS
13 ART BENCH
14 PROTECT EXISTING OWL ROCK
15 SPLASH PLAY
16 SKATE SPOT
17 ADVENTURE PLAY
18 ZIP LINE
19 RIPARIAN/RIVERINE AREAS
W. METZ ROAD
WESTON ROAD
DIANA STREET
TIERNEY DRIVE
BARBARA DRIVE
ENCHANTED HILLS PARK
CITY OF PERRIS

Appendix 3: Soils Information

Geotechnical Study and Other Infiltration Testing Data

No Soils Report has been provided for the Preliminary WQMP.

Appendix 4: Historical Site Conditions

Phase I Environmental Site Assessment or Other Information on Past Site Use

N/A

Appendix 5: LID Infeasibility

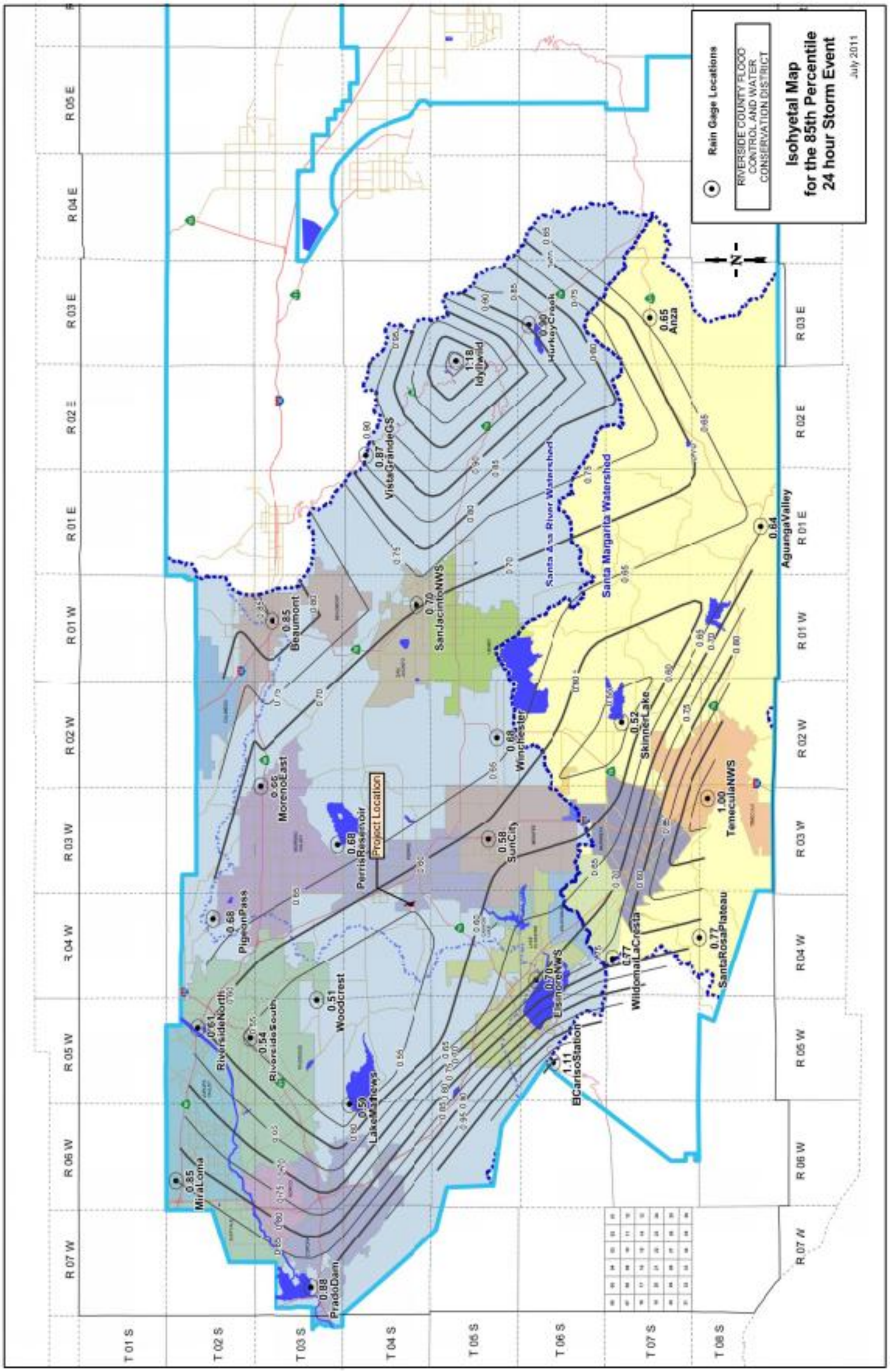
LID Technical Infeasibility Analysis

N/A

Appendix 6: BMP Design Details

BMP Sizing, Design Details and other Supporting Documentation

VBMP calculations and Bioretention Basin sizing calculations are preliminary. Final analysis will be done with the Final WQMP and will be based on the final design of the park and associated BMPs.


Rain Gage Locations
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
Isohyetal Map
for the 85th Percentile
24 hour Storm Event
July 2011
Project Location
Santa Ana River Watershed
Santa Margarita Watershed
0.85 MiraLoma
0.88 PradoDam
0.61 RiversideNorth
0.54 RiversideSouth
0.53 LakeMathews
0.51 Woodcrest
0.68 PigeonPass
0.66 MorenoEast
0.68 PerrisReservoir
0.58 SunCity
0.68 Winchester
0.85 Beaumont
0.70 SanJacintoNWS
0.87 VistaGrandeGS
1.18 Idyllwild
0.90 HurkeyCreek
0.65 Anza
0.64 AguangaValley
0.52 SkinnerLake
1.00 TemeculaNWS
0.77 SantaRosaPlateau
0.77 WildomarLaCresta
0.70 ElsinoreNWS
1.11 ElCariso Station
T 01 S
T 02 S
T 03 S
T 04 S
T 05 S
T 06 S
T 07 S
T 08 S
R 07 W
R 06 W
R 05 W
R 04 W
R 03 W
R 02 W
R 01 W
R 01 E
R 02 E
R 03 E
R 04 E
R 05 E

Santa Ana Watershed - BMP Design Volume, V_{BMP}

(Rev. 10-2011)

Legend: Required Entries / Calculated Cells

*(Note this worksheet shall **only** be used in conjunction with BMP designs from the **LID BMP Design Handbook**)*

Company Name: Cvaldo Corporation | Date: 1/7/2020

Designed by: KRH | Case No:

Company Project Number/Name: Enchanted Hills Park

BMP Identification

BMP NAME / ID: Basin 1

Must match Name/ID used on BMP Design Calculation Sheet

Design Rainfall Depth

85th Percentile, 24-hour Rainfall Depth, from the Isohyetal Map in Handbook Appendix E

D_{85}= 0.56 inches

Drainage Management Area Tabulation

Insert additional rows if needed to accommodate all DMAs draining to the BMP

DMA Type/ID	DMA Area (square feet)	Post-Project Surface Type	Effective Imperivous Fraction, I_f	DMA Runoff Factor	DMA Areas x Runoff Factor	*Design Storm Depth (in)*	*Design Capture Volume, V_{BMP} (cubic feet)*	*Proposed Volume on Plans (cubic feet)*
DMA 2	276024	Concrete or Asphalt	1	0.89	246213.4			
	109436	Mixed Surface Types	0.15	0.14	15479.3			
	437744	Natural (C Soil)	0.3	0.23	98565.1			
	823204	*Total*			360257.8	0.56	16812	20000

Notes:

Bioretention Facility - Design Procedure	BMP ID	Legend:	Required Entries
			Calculated Cells

Company Name: Cvaldo Corporation | Date: 1/7/2020

Designed by: KRH | County/City Case No.: N/A

Design Volume

Enter the area tributary to this feature A_T= 18.9 acres

Enter V_{BMP} determined from Section 2.1 of this Handbook V_{BMP}= 16,812 ft^3

Type of Bioretention Facility Design

◉ Side slopes required (parallel to parking spaces or adjacent to walkways)

○ No side slopes required (perpendicular to parking space or Planter Boxes)

Bioretention Facility Surface Area

Depth of Soil Filter Media Layer d_S = 3.0 ft

Top Width of Bioretention Facility, excluding curb w_T = 100.0 ft

Total Effective Depth, d_E

$d_E = (0.3) \times d_S + (0.4) \times 1 - (0.7/w_T) + 0.5$ d_E = 1.79 ft

Minimum Surface Area, A_m

$$A_M\ (ft^2) = \frac{V_{BMP}\ (ft^3)}{d_E\ (ft)}$$ A_M = 9,377 ft^2

Proposed Surface Area A= 10,000 ft^2

Bioretention Facility Properties

Side Slopes in Bioretention Facility z = 4 :1

Diameter of Underdrain 6 inches

Longitudinal Slope of Site (3% maximum) 0 %

6" Check Dam Spacing 0 feet

Describe Vegetation: Natural Grasses

Notes: Basin 1 is located in the southwest portion of the site. It receives flows from onsite DMA 2.
Note that all offsite flows are pass through and do not contribute to Basin 1.

	2 year – 24 hour		
	Pre-condition	**Post-condition**	**% Difference**
Time of Concentration	13.46 Hours	13.42 Hours	2.97%
Volume (Cubic Feet)	49,204	49,395	3.88%

Post development volume and time of concentration varies less than 5% from the existing condition.

U n i t   H y d r o g r a p h   A n a l y s i s

Copyright (c) CIVILCADD/CIVILDESIGN, 1989 - 2008, Version 8.1
Study date 01/08/20 File: enchantedex242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 4011

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Enchanted Hills Park Existing Condition

Drainage Area = 18.90(Ac.) = 0.030 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.90(Ac.) = 0.030 Sq. Mi.
Length along longest watercourse = 1280.00(Ft.)
Length along longest watercourse measured to centroid = 780.00(Ft.)
Length along longest watercourse = 0.242 Mi.
Length along longest watercourse measured to centroid = 0.148 Mi.
Difference in elevation = 35.00(Ft.)
Slope along watercourse = 144.3750 Ft./Mi.
Average Manning's 'N' = 0.030
Lag time = 0.079 Hr.
Lag time = 4.74 Min.
25% of lag time = 1.18 Min.
40% of lag time = 1.90 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.90	2.00	37.80

100 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.90	5.50	103.95

STORM EVENT (YEAR) = 2.00

Area Averaged 2-Year Rainfall = 2.000(In)
Area Averaged 100-Year Rainfall = 5.500(In)

Point rain (area averaged) = 2.000(In)
Areal adjustment factor = 100.00 %
Adjusted average point rain = 2.000(In)

Sub-Area Data:

Area(Ac.)	Runoff Index	Impervious %
3.780	86.00	0.150
15.120	91.00	0.300

Total Area Entered = 18.90(Ac.)

RI AMC2	RI AMC-2	Infil. Rate (In/Hr)	Impervious (Dec.%)	Adj. Infil. Rate (In/Hr)	Area% (Dec.)	F (In/Hr)
86.0	86.0	0.176	0.150	0.152	0.200	0.030
91.0	91.0	0.117	0.300	0.085	0.800	0.068
					Sum (F) =	0.099

Area averaged mean soil loss (F) (In/Hr) = 0.099
Minimum soil loss rate ((In/Hr)) = 0.049
(for 24 hour storm duration)
Soil low loss rate (decimal) = 0.900

U n i t H y d r o g r a p h
VALLEY S-Curve

Unit Hydrograph Data

Unit time period (hrs)		Time % of lag	Distribution Graph %	Unit Hydrograph (CFS)
1	0.083	105.501	20.881	3.977
2	0.167	211.002	48.716	9.279
3	0.250	316.502	14.861	2.831
4	0.333	422.003	6.775	1.291
5	0.417	527.504	3.772	0.718
6	0.500	633.005	2.408	0.459
7	0.583	738.506	1.438	0.274
8	0.667	844.006	1.148	0.219
			Sum = 100.000	Sum= 19.048

The following loss rate calculations reflect use of the minimum calculated loss rate subtracted from the Storm Rain to produce the maximum Effective Rain value

Unit	Time (Hr.)	Pattern Percent	Storm Rain (In/Hr)	Loss rate(In./Hr) Max	Low	Effective (In/Hr)
1	0.08	0.07	0.016	(0.175)	0.014	0.002
2	0.17	0.07	0.016	(0.174)	0.014	0.002

3	0.25	0.07	0.016	(0.174)	0.014	0.002
4	0.33	0.10	0.024	(0.173)	0.022	0.002
5	0.42	0.10	0.024	(0.172)	0.022	0.002
6	0.50	0.10	0.024	(0.172)	0.022	0.002
7	0.58	0.10	0.024	(0.171)	0.022	0.002
8	0.67	0.10	0.024	(0.170)	0.022	0.002
9	0.75	0.10	0.024	(0.170)	0.022	0.002
10	0.83	0.13	0.032	(0.169)	0.029	0.003
11	0.92	0.13	0.032	(0.168)	0.029	0.003
12	1.00	0.13	0.032	(0.168)	0.029	0.003
13	1.08	0.10	0.024	(0.167)	0.022	0.002
14	1.17	0.10	0.024	(0.166)	0.022	0.002
15	1.25	0.10	0.024	(0.166)	0.022	0.002
16	1.33	0.10	0.024	(0.165)	0.022	0.002
17	1.42	0.10	0.024	(0.164)	0.022	0.002
18	1.50	0.10	0.024	(0.164)	0.022	0.002
19	1.58	0.10	0.024	(0.163)	0.022	0.002
20	1.67	0.10	0.024	(0.162)	0.022	0.002
21	1.75	0.10	0.024	(0.162)	0.022	0.002
22	1.83	0.13	0.032	(0.161)	0.029	0.003
23	1.92	0.13	0.032	(0.160)	0.029	0.003
24	2.00	0.13	0.032	(0.160)	0.029	0.003
25	2.08	0.13	0.032	(0.159)	0.029	0.003
26	2.17	0.13	0.032	(0.158)	0.029	0.003
27	2.25	0.13	0.032	(0.158)	0.029	0.003
28	2.33	0.13	0.032	(0.157)	0.029	0.003
29	2.42	0.13	0.032	(0.157)	0.029	0.003
30	2.50	0.13	0.032	(0.156)	0.029	0.003
31	2.58	0.17	0.040	(0.155)	0.036	0.004
32	2.67	0.17	0.040	(0.155)	0.036	0.004
33	2.75	0.17	0.040	(0.154)	0.036	0.004
34	2.83	0.17	0.040	(0.153)	0.036	0.004
35	2.92	0.17	0.040	(0.153)	0.036	0.004
36	3.00	0.17	0.040	(0.152)	0.036	0.004
37	3.08	0.17	0.040	(0.151)	0.036	0.004
38	3.17	0.17	0.040	(0.151)	0.036	0.004
39	3.25	0.17	0.040	(0.150)	0.036	0.004
40	3.33	0.17	0.040	(0.150)	0.036	0.004
41	3.42	0.17	0.040	(0.149)	0.036	0.004
42	3.50	0.17	0.040	(0.148)	0.036	0.004
43	3.58	0.17	0.040	(0.148)	0.036	0.004
44	3.67	0.17	0.040	(0.147)	0.036	0.004
45	3.75	0.17	0.040	(0.146)	0.036	0.004
46	3.83	0.20	0.048	(0.146)	0.043	0.005
47	3.92	0.20	0.048	(0.145)	0.043	0.005
48	4.00	0.20	0.048	(0.145)	0.043	0.005
49	4.08	0.20	0.048	(0.144)	0.043	0.005
50	4.17	0.20	0.048	(0.143)	0.043	0.005
51	4.25	0.20	0.048	(0.143)	0.043	0.005
52	4.33	0.23	0.056	(0.142)	0.050	0.006
53	4.42	0.23	0.056	(0.142)	0.050	0.006
54	4.50	0.23	0.056	(0.141)	0.050	0.006
55	4.58	0.23	0.056	(0.140)	0.050	0.006
56	4.67	0.23	0.056	(0.140)	0.050	0.006
57	4.75	0.23	0.056	(0.139)	0.050	0.006
58	4.83	0.27	0.064	(0.139)	0.058	0.006

59	4.92	0.27	0.064	(0.138)	0.058	0.006
60	5.00	0.27	0.064	(0.137)	0.058	0.006
61	5.08	0.20	0.048	(0.137)	0.043	0.005
62	5.17	0.20	0.048	(0.136)	0.043	0.005
63	5.25	0.20	0.048	(0.136)	0.043	0.005
64	5.33	0.23	0.056	(0.135)	0.050	0.006
65	5.42	0.23	0.056	(0.134)	0.050	0.006
66	5.50	0.23	0.056	(0.134)	0.050	0.006
67	5.58	0.27	0.064	(0.133)	0.058	0.006
68	5.67	0.27	0.064	(0.133)	0.058	0.006
69	5.75	0.27	0.064	(0.132)	0.058	0.006
70	5.83	0.27	0.064	(0.131)	0.058	0.006
71	5.92	0.27	0.064	(0.131)	0.058	0.006
72	6.00	0.27	0.064	(0.130)	0.058	0.006
73	6.08	0.30	0.072	(0.130)	0.065	0.007
74	6.17	0.30	0.072	(0.129)	0.065	0.007
75	6.25	0.30	0.072	(0.129)	0.065	0.007
76	6.33	0.30	0.072	(0.128)	0.065	0.007
77	6.42	0.30	0.072	(0.127)	0.065	0.007
78	6.50	0.30	0.072	(0.127)	0.065	0.007
79	6.58	0.33	0.080	(0.126)	0.072	0.008
80	6.67	0.33	0.080	(0.126)	0.072	0.008
81	6.75	0.33	0.080	(0.125)	0.072	0.008
82	6.83	0.33	0.080	(0.125)	0.072	0.008
83	6.92	0.33	0.080	(0.124)	0.072	0.008
84	7.00	0.33	0.080	(0.123)	0.072	0.008
85	7.08	0.33	0.080	(0.123)	0.072	0.008
86	7.17	0.33	0.080	(0.122)	0.072	0.008
87	7.25	0.33	0.080	(0.122)	0.072	0.008
88	7.33	0.37	0.088	(0.121)	0.079	0.009
89	7.42	0.37	0.088	(0.121)	0.079	0.009
90	7.50	0.37	0.088	(0.120)	0.079	0.009
91	7.58	0.40	0.096	(0.120)	0.086	0.010
92	7.67	0.40	0.096	(0.119)	0.086	0.010
93	7.75	0.40	0.096	(0.118)	0.086	0.010
94	7.83	0.43	0.104	(0.118)	0.094	0.010
95	7.92	0.43	0.104	(0.117)	0.094	0.010
96	8.00	0.43	0.104	(0.117)	0.094	0.010
97	8.08	0.50	0.120	(0.116)	0.108	0.012
98	8.17	0.50	0.120	(0.116)	0.108	0.012
99	8.25	0.50	0.120	(0.115)	0.108	0.012
100	8.33	0.50	0.120	(0.115)	0.108	0.012
101	8.42	0.50	0.120	(0.114)	0.108	0.012
102	8.50	0.50	0.120	(0.114)	0.108	0.012
103	8.58	0.53	0.128	0.113	(0.115)	0.015
104	8.67	0.53	0.128	0.113	(0.115)	0.015
105	8.75	0.53	0.128	0.112	(0.115)	0.016
106	8.83	0.57	0.136	0.111	(0.122)	0.025
107	8.92	0.57	0.136	0.111	(0.122)	0.025
108	9.00	0.57	0.136	0.110	(0.122)	0.026
109	9.08	0.63	0.152	0.110	(0.137)	0.042
110	9.17	0.63	0.152	0.109	(0.137)	0.043
111	9.25	0.63	0.152	0.109	(0.137)	0.043
112	9.33	0.67	0.160	0.108	(0.144)	0.052
113	9.42	0.67	0.160	0.108	(0.144)	0.052
114	9.50	0.67	0.160	0.107	(0.144)	0.053

115	9.58	0.70	0.168	0.107	(0.151)	0.061
116	9.67	0.70	0.168	0.106	(0.151)	0.062
117	9.75	0.70	0.168	0.106	(0.151)	0.062
118	9.83	0.73	0.176	0.105	(0.158)	0.071
119	9.92	0.73	0.176	0.105	(0.158)	0.071
120	10.00	0.73	0.176	0.104	(0.158)	0.072
121	10.08	0.50	0.120	0.104	(0.108)	0.016
122	10.17	0.50	0.120	0.103	(0.108)	0.017
123	10.25	0.50	0.120	0.103	(0.108)	0.017
124	10.33	0.50	0.120	0.102	(0.108)	0.018
125	10.42	0.50	0.120	0.102	(0.108)	0.018
126	10.50	0.50	0.120	0.101	(0.108)	0.019
127	10.58	0.67	0.160	0.101	(0.144)	0.059
128	10.67	0.67	0.160	0.100	(0.144)	0.060
129	10.75	0.67	0.160	0.100	(0.144)	0.060
130	10.83	0.67	0.160	0.099	(0.144)	0.061
131	10.92	0.67	0.160	0.099	(0.144)	0.061
132	11.00	0.67	0.160	0.098	(0.144)	0.062
133	11.08	0.63	0.152	0.098	(0.137)	0.054
134	11.17	0.63	0.152	0.097	(0.137)	0.055
135	11.25	0.63	0.152	0.097	(0.137)	0.055
136	11.33	0.63	0.152	0.096	(0.137)	0.056
137	11.42	0.63	0.152	0.096	(0.137)	0.056
138	11.50	0.63	0.152	0.095	(0.137)	0.057
139	11.58	0.57	0.136	0.095	(0.122)	0.041
140	11.67	0.57	0.136	0.094	(0.122)	0.042
141	11.75	0.57	0.136	0.094	(0.122)	0.042
142	11.83	0.60	0.144	0.094	(0.130)	0.050
143	11.92	0.60	0.144	0.093	(0.130)	0.051
144	12.00	0.60	0.144	0.093	(0.130)	0.051
145	12.08	0.83	0.200	0.092	(0.180)	0.108
146	12.17	0.83	0.200	0.092	(0.180)	0.108
147	12.25	0.83	0.200	0.091	(0.180)	0.109
148	12.33	0.87	0.208	0.091	(0.187)	0.117
149	12.42	0.87	0.208	0.090	(0.187)	0.118
150	12.50	0.87	0.208	0.090	(0.187)	0.118
151	12.58	0.93	0.224	0.089	(0.202)	0.135
152	12.67	0.93	0.224	0.089	(0.202)	0.135
153	12.75	0.93	0.224	0.089	(0.202)	0.135
154	12.83	0.97	0.232	0.088	(0.209)	0.144
155	12.92	0.97	0.232	0.088	(0.209)	0.144
156	13.00	0.97	0.232	0.087	(0.209)	0.145
157	13.08	1.13	0.272	0.087	(0.245)	0.185
158	13.17	1.13	0.272	0.086	(0.245)	0.186
159	13.25	1.13	0.272	0.086	(0.245)	0.186
160	13.33	1.13	0.272	0.085	(0.245)	0.187
161	13.42	1.13	0.272	0.085	(0.245)	0.187
162	13.50	1.13	0.272	0.085	(0.245)	0.187
163	13.58	0.77	0.184	0.084	(0.166)	0.100
164	13.67	0.77	0.184	0.084	(0.166)	0.100
165	13.75	0.77	0.184	0.083	(0.166)	0.101
166	13.83	0.77	0.184	0.083	(0.166)	0.101
167	13.92	0.77	0.184	0.082	(0.166)	0.102
168	14.00	0.77	0.184	0.082	(0.166)	0.102
169	14.08	0.90	0.216	0.082	(0.194)	0.134
170	14.17	0.90	0.216	0.081	(0.194)	0.135

171	14.25	0.90	0.216	0.081	(0.194)	0.135
172	14.33	0.87	0.208	0.080	(0.187)	0.128
173	14.42	0.87	0.208	0.080	(0.187)	0.128
174	14.50	0.87	0.208	0.080	(0.187)	0.128
175	14.58	0.87	0.208	0.079	(0.187)	0.129
176	14.67	0.87	0.208	0.079	(0.187)	0.129
177	14.75	0.87	0.208	0.078	(0.187)	0.130
178	14.83	0.83	0.200	0.078	(0.180)	0.122
179	14.92	0.83	0.200	0.077	(0.180)	0.123
180	15.00	0.83	0.200	0.077	(0.180)	0.123
181	15.08	0.80	0.192	0.077	(0.173)	0.115
182	15.17	0.80	0.192	0.076	(0.173)	0.116
183	15.25	0.80	0.192	0.076	(0.173)	0.116
184	15.33	0.77	0.184	0.076	(0.166)	0.108
185	15.42	0.77	0.184	0.075	(0.166)	0.109
186	15.50	0.77	0.184	0.075	(0.166)	0.109
187	15.58	0.63	0.152	0.074	(0.137)	0.078
188	15.67	0.63	0.152	0.074	(0.137)	0.078
189	15.75	0.63	0.152	0.074	(0.137)	0.078
190	15.83	0.63	0.152	0.073	(0.137)	0.079
191	15.92	0.63	0.152	0.073	(0.137)	0.079
192	16.00	0.63	0.152	0.072	(0.137)	0.080
193	16.08	0.13	0.032	(0.072)	0.029	0.003
194	16.17	0.13	0.032	(0.072)	0.029	0.003
195	16.25	0.13	0.032	(0.071)	0.029	0.003
196	16.33	0.13	0.032	(0.071)	0.029	0.003
197	16.42	0.13	0.032	(0.071)	0.029	0.003
198	16.50	0.13	0.032	(0.070)	0.029	0.003
199	16.58	0.10	0.024	(0.070)	0.022	0.002
200	16.67	0.10	0.024	(0.070)	0.022	0.002
201	16.75	0.10	0.024	(0.069)	0.022	0.002
202	16.83	0.10	0.024	(0.069)	0.022	0.002
203	16.92	0.10	0.024	(0.069)	0.022	0.002
204	17.00	0.10	0.024	(0.068)	0.022	0.002
205	17.08	0.17	0.040	(0.068)	0.036	0.004
206	17.17	0.17	0.040	(0.067)	0.036	0.004
207	17.25	0.17	0.040	(0.067)	0.036	0.004
208	17.33	0.17	0.040	(0.067)	0.036	0.004
209	17.42	0.17	0.040	(0.066)	0.036	0.004
210	17.50	0.17	0.040	(0.066)	0.036	0.004
211	17.58	0.17	0.040	(0.066)	0.036	0.004
212	17.67	0.17	0.040	(0.065)	0.036	0.004
213	17.75	0.17	0.040	(0.065)	0.036	0.004
214	17.83	0.13	0.032	(0.065)	0.029	0.003
215	17.92	0.13	0.032	(0.065)	0.029	0.003
216	18.00	0.13	0.032	(0.064)	0.029	0.003
217	18.08	0.13	0.032	(0.064)	0.029	0.003
218	18.17	0.13	0.032	(0.064)	0.029	0.003
219	18.25	0.13	0.032	(0.063)	0.029	0.003
220	18.33	0.13	0.032	(0.063)	0.029	0.003
221	18.42	0.13	0.032	(0.063)	0.029	0.003
222	18.50	0.13	0.032	(0.062)	0.029	0.003
223	18.58	0.10	0.024	(0.062)	0.022	0.002
224	18.67	0.10	0.024	(0.062)	0.022	0.002
225	18.75	0.10	0.024	(0.061)	0.022	0.002
226	18.83	0.07	0.016	(0.061)	0.014	0.002

227	18.92	0.07	0.016	(0.061)	0.014	0.002
228	19.00	0.07	0.016	(0.061)	0.014	0.002
229	19.08	0.10	0.024	(0.060)	0.022	0.002
230	19.17	0.10	0.024	(0.060)	0.022	0.002
231	19.25	0.10	0.024	(0.060)	0.022	0.002
232	19.33	0.13	0.032	(0.059)	0.029	0.003
233	19.42	0.13	0.032	(0.059)	0.029	0.003
234	19.50	0.13	0.032	(0.059)	0.029	0.003
235	19.58	0.10	0.024	(0.059)	0.022	0.002
236	19.67	0.10	0.024	(0.058)	0.022	0.002
237	19.75	0.10	0.024	(0.058)	0.022	0.002
238	19.83	0.07	0.016	(0.058)	0.014	0.002
239	19.92	0.07	0.016	(0.058)	0.014	0.002
240	20.00	0.07	0.016	(0.057)	0.014	0.002
241	20.08	0.10	0.024	(0.057)	0.022	0.002
242	20.17	0.10	0.024	(0.057)	0.022	0.002
243	20.25	0.10	0.024	(0.057)	0.022	0.002
244	20.33	0.10	0.024	(0.056)	0.022	0.002
245	20.42	0.10	0.024	(0.056)	0.022	0.002
246	20.50	0.10	0.024	(0.056)	0.022	0.002
247	20.58	0.10	0.024	(0.056)	0.022	0.002
248	20.67	0.10	0.024	(0.055)	0.022	0.002
249	20.75	0.10	0.024	(0.055)	0.022	0.002
250	20.83	0.07	0.016	(0.055)	0.014	0.002
251	20.92	0.07	0.016	(0.055)	0.014	0.002
252	21.00	0.07	0.016	(0.054)	0.014	0.002
253	21.08	0.10	0.024	(0.054)	0.022	0.002
254	21.17	0.10	0.024	(0.054)	0.022	0.002
255	21.25	0.10	0.024	(0.054)	0.022	0.002
256	21.33	0.07	0.016	(0.054)	0.014	0.002
257	21.42	0.07	0.016	(0.053)	0.014	0.002
258	21.50	0.07	0.016	(0.053)	0.014	0.002
259	21.58	0.10	0.024	(0.053)	0.022	0.002
260	21.67	0.10	0.024	(0.053)	0.022	0.002
261	21.75	0.10	0.024	(0.053)	0.022	0.002
262	21.83	0.07	0.016	(0.052)	0.014	0.002
263	21.92	0.07	0.016	(0.052)	0.014	0.002
264	22.00	0.07	0.016	(0.052)	0.014	0.002
265	22.08	0.10	0.024	(0.052)	0.022	0.002
266	22.17	0.10	0.024	(0.052)	0.022	0.002
267	22.25	0.10	0.024	(0.052)	0.022	0.002
268	22.33	0.07	0.016	(0.051)	0.014	0.002
269	22.42	0.07	0.016	(0.051)	0.014	0.002
270	22.50	0.07	0.016	(0.051)	0.014	0.002
271	22.58	0.07	0.016	(0.051)	0.014	0.002
272	22.67	0.07	0.016	(0.051)	0.014	0.002
273	22.75	0.07	0.016	(0.051)	0.014	0.002
274	22.83	0.07	0.016	(0.051)	0.014	0.002
275	22.92	0.07	0.016	(0.050)	0.014	0.002
276	23.00	0.07	0.016	(0.050)	0.014	0.002
277	23.08	0.07	0.016	(0.050)	0.014	0.002
278	23.17	0.07	0.016	(0.050)	0.014	0.002
279	23.25	0.07	0.016	(0.050)	0.014	0.002
280	23.33	0.07	0.016	(0.050)	0.014	0.002
281	23.42	0.07	0.016	(0.050)	0.014	0.002
282	23.50	0.07	0.016	(0.050)	0.014	0.002

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283  23.58     0.07      0.016       (  0.050)      0.014        0.002
284  23.67     0.07      0.016       (  0.050)      0.014        0.002
285  23.75     0.07      0.016       (  0.049)      0.014        0.002
286  23.83     0.07      0.016       (  0.049)      0.014        0.002
287  23.92     0.07      0.016       (  0.049)      0.014        0.002
288  24.00     0.07      0.016       (  0.049)      0.014        0.002
              (Loss Rate Not Used)
    Sum =     100.0                               Sum =     8.6
      Flood volume = Effective rainfall      0.72(In)
       times area      18.9(Ac.)/[(In)/(Ft.)] =       1.1(Ac.Ft)
      Total soil loss =      1.28(In)
      Total soil loss =     2.020(Ac.Ft)
      Total rainfall =      2.00(In)
      Flood volume =       49203.9 Cubic Feet
      Total soil loss =      88005.1 Cubic Feet
      --------------------------------------------------------------------
       Peak flow rate of this hydrograph =      3.541(CFS)
      --------------------------------------------------------------------
      ++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++++
                          24 - H O U R   S T O R M
                    R u n o f f    H y d r o g r a p h
      --------------------------------------------------------------------
                 Hydrograph in   5   Minute intervals ((CFS))

      --------------------------------------------------------------------
 Time(h+m) Volume Ac.Ft   Q(CFS)  0        2.5       5.0       7.5      10.0
-----------------------------------------------------------------------
   0+ 5       0.0000      0.01  Q         |         |         |         |
   0+10       0.0002      0.02  Q         |         |         |         |
   0+15       0.0004      0.03  Q         |         |         |         |
   0+20       0.0006      0.03  Q         |         |         |         |
   0+25       0.0009      0.04  Q         |         |         |         |
   0+30       0.0011      0.04  Q         |         |         |         |
   0+35       0.0015      0.04  Q         |         |         |         |
   0+40       0.0018      0.04  Q         |         |         |         |
   0+45       0.0021      0.05  Q         |         |         |         |
   0+50       0.0024      0.05  Q         |         |         |         |
   0+55       0.0028      0.06  Q         |         |         |         |
   1+ 0       0.0032      0.06  Q         |         |         |         |
   1+ 5       0.0036      0.06  Q         |         |         |         |
   1+10       0.0039      0.05  Q         |         |         |         |
   1+15       0.0043      0.05  Q         |         |         |         |
   1+20       0.0046      0.05  Q         |         |         |         |
   1+25       0.0049      0.05  Q         |         |         |         |
   1+30       0.0052      0.05  Q         |         |         |         |
   1+35       0.0055      0.05  Q         |         |         |         |
   1+40       0.0059      0.05  Q         |         |         |         |
   1+45       0.0062      0.05  Q         |         |         |         |
   1+50       0.0065      0.05  Q         |         |         |         |
   1+55       0.0069      0.06  Q         |         |         |         |
   2+ 0       0.0073      0.06  Q         |         |         |         |
   2+ 5       0.0077      0.06  Q         |         |         |         |
   2+10       0.0081      0.06  Q         |         |         |         |
   2+15       0.0085      0.06  Q         |         |         |         |
   2+20       0.0090      0.06  Q         |         |         |         |
   2+25       0.0094      0.06  Q         |         |         |         |
```

2+30	0.0098	0.06	Q	|	|	|	|
2+35	0.0102	0.06	Q	|	|	|	|
2+40	0.0107	0.07	Q	|	|	|	|
2+45	0.0112	0.07	Q	|	|	|	|
2+50	0.0118	0.07	Q	|	|	|	|
2+55	0.0123	0.08	Q	|	|	|	|
3+ 0	0.0128	0.08	Q	|	|	|	|
3+ 5	0.0133	0.08	Q	|	|	|	|
3+10	0.0138	0.08	Q	|	|	|	|
3+15	0.0144	0.08	Q	|	|	|	|
3+20	0.0149	0.08	Q	|	|	|	|
3+25	0.0154	0.08	Q	|	|	|	|
3+30	0.0159	0.08	Q	|	|	|	|
3+35	0.0165	0.08	Q	|	|	|	|
3+40	0.0170	0.08	Q	|	|	|	|
3+45	0.0175	0.08	Q	|	|	|	|
3+50	0.0181	0.08	Q	|	|	|	|
3+55	0.0187	0.09	Q	|	|	|	|
4+ 0	0.0193	0.09	Q	|	|	|	|
4+ 5	0.0199	0.09	Q	|	|	|	|
4+10	0.0205	0.09	Q	|	|	|	|
4+15	0.0212	0.09	Q	|	|	|	|
4+20	0.0218	0.09	Q	|	|	|	|
4+25	0.0225	0.10	Q	|	|	|	|
4+30	0.0232	0.10	Q	|	|	|	|
4+35	0.0240	0.11	Q	|	|	|	|
4+40	0.0247	0.11	Q	|	|	|	|
4+45	0.0254	0.11	Q	|	|	|	|
4+50	0.0262	0.11	Q	|	|	|	|
4+55	0.0270	0.12	Q	|	|	|	|
5+ 0	0.0278	0.12	Q	|	|	|	|
5+ 5	0.0286	0.11	QV	|	|	|	|
5+10	0.0293	0.10	QV	|	|	|	|
5+15	0.0299	0.10	QV	|	|	|	|
5+20	0.0306	0.10	QV	|	|	|	|
5+25	0.0313	0.10	QV	|	|	|	|
5+30	0.0320	0.11	QV	|	|	|	|
5+35	0.0328	0.11	QV	|	|	|	|
5+40	0.0336	0.12	QV	|	|	|	|
5+45	0.0344	0.12	QV	|	|	|	|
5+50	0.0352	0.12	QV	|	|	|	|
5+55	0.0361	0.12	QV	|	|	|	|
6+ 0	0.0369	0.12	QV	|	|	|	|
6+ 5	0.0378	0.12	QV	|	|	|	|
6+10	0.0387	0.13	QV	|	|	|	|
6+15	0.0396	0.13	QV	|	|	|	|
6+20	0.0406	0.14	QV	|	|	|	|
6+25	0.0415	0.14	QV	|	|	|	|
6+30	0.0424	0.14	QV	|	|	|	|
6+35	0.0434	0.14	QV	|	|	|	|
6+40	0.0444	0.15	QV	|	|	|	|
6+45	0.0455	0.15	QV	|	|	|	|
6+50	0.0465	0.15	QV	|	|	|	|
6+55	0.0475	0.15	QV	|	|	|	|
7+ 0	0.0486	0.15	QV	|	|	|	|
7+ 5	0.0496	0.15	QV	|	|	|	|

```
  7+10       0.0507      0.15  QV        |         |         |         |
  7+15       0.0517      0.15  QV        |         |         |         |
  7+20       0.0528      0.16  QV        |         |         |         |
  7+25       0.0539      0.16  QV        |         |         |         |
  7+30       0.0551      0.17  QV        |         |         |         |
  7+35       0.0562      0.17  QV        |         |         |         |
  7+40       0.0575      0.18  Q V       |         |         |         |
  7+45       0.0587      0.18  Q V       |         |         |         |
  7+50       0.0600      0.18  Q V       |         |         |         |
  7+55       0.0613      0.19  Q V       |         |         |         |
  8+ 0       0.0626      0.20  Q V       |         |         |         |
  8+ 5       0.0640      0.20  Q V       |         |         |         |
  8+10       0.0656      0.22  Q V       |         |         |         |
  8+15       0.0671      0.22  Q V       |         |         |         |
  8+20       0.0686      0.23  Q V       |         |         |         |
  8+25       0.0702      0.23  Q V       |         |         |         |
  8+30       0.0718      0.23  Q V       |         |         |         |
  8+35       0.0734      0.24  Q V       |         |         |         |
  8+40       0.0753      0.27  |QV       |         |         |         |
  8+45       0.0773      0.29  |QV       |         |         |         |
  8+50       0.0795      0.33  |QV       |         |         |         |
  8+55       0.0824      0.41  |QV       |         |         |         |
  9+ 0       0.0855      0.45  |Q V      |         |         |         |
  9+ 5       0.0891      0.53  | QV      |         |         |         |
  9+10       0.0939      0.70  | QV      |         |         |         |
  9+15       0.0992      0.76  |  Q      |         |         |         |
  9+20       0.1048      0.82  |  Q      |         |         |         |
  9+25       0.1111      0.92  |  Q      |         |         |         |
  9+30       0.1177      0.96  |  QV     |         |         |         |
  9+35       0.1247      1.02  |   Q     |         |         |         |
  9+40       0.1324      1.11  |   Q     |         |         |         |
  9+45       0.1403      1.14  |   Q     |         |         |         |
  9+50       0.1485      1.20  |   QV    |         |         |         |
  9+55       0.1574      1.29  |    Q    |         |         |         |
 10+ 0       0.1665      1.33  |    Q    |         |         |         |
 10+ 5       0.1743      1.13  |   Q V   |         |         |         |
 10+10       0.1786      0.62  | Q   V   |         |         |         |
 10+15       0.1819      0.48  |Q    V   |         |         |         |
 10+20       0.1847      0.42  |Q    V   |         |         |         |
 10+25       0.1874      0.39  |Q    V   |         |         |         |
 10+30       0.1900      0.37  |Q    V   |         |         |         |
 10+35       0.1936      0.52  | Q   V   |         |         |         |
 10+40       0.1997      0.89  |  Q   V  |         |         |         |
 10+45       0.2067      1.02  |   Q  V  |         |         |         |
 10+50       0.2141      1.08  |   Q  V  |         |         |         |
 10+55       0.2218      1.12  |   Q  V  |         |         |         |
 11+ 0       0.2297      1.14  |   Q   V |         |         |         |
 11+ 5       0.2375      1.13  |   Q   V |         |         |         |
 11+10       0.2449      1.07  |   Q   V |         |         |         |
 11+15       0.2522      1.06  |   Q   V |         |         |         |
 11+20       0.2595      1.06  |   Q    V|         |         |         |
 11+25       0.2668      1.06  |   Q    V|         |         |         |
 11+30       0.2742      1.07  |   Q    V|         |         |         |
 11+35       0.2812      1.01  |   Q    V|         |         |         |
 11+40       0.2872      0.87  |  Q      V         |         |         |
 11+45       0.2929      0.83  |  Q      V         |         |         |
```

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11+50       0.2988      0.85  |  Q      V         |         |         |
11+55       0.3052      0.93  |  Q      V         |         |         |
12+ 0       0.3117      0.95  |  Q      |V        |         |         |
12+ 5       0.3199      1.19  |   Q     |V        |         |         |
12+10       0.3318      1.72  |     Q   |V        |         |         |
12+15       0.3448      1.89  |      Q  | V       |         |         |
12+20       0.3586      2.01  |       Q | V       |         |         |
12+25       0.3733      2.13  |       Q |  V      |         |         |
12+30       0.3883      2.19  |       Q |  V      |         |         |
12+35       0.4041      2.29  |        Q|   V     |         |         |
12+40       0.4210      2.46  |        Q|   V     |         |         |
12+45       0.4384      2.52  |         Q    V    |         |         |
12+50       0.4562      2.58  |         Q     V   |         |         |
12+55       0.4746      2.68  |         Q     V   |         |         |
13+ 0       0.4933      2.72  |         Q      V  |         |         |
13+ 5       0.5133      2.90  |         |Q      V |         |         |
13+10       0.5359      3.29  |         |  Q    V |         |         |
13+15       0.5594      3.41  |         |  Q     V|         |         |
13+20       0.5834      3.48  |         |  Q      V         |         |
13+25       0.6076      3.51  |         |   Q     |V        |         |
13+30       0.6319      3.54  |         |   Q     | V       |         |
13+35       0.6540      3.21  |         | Q       |  V      |         |
13+40       0.6706      2.41  |        Q|         |  V      |         |
13+45       0.6856      2.17  |       Q |         |   V     |         |
13+50       0.6998      2.06  |       Q |         |   V     |         |
13+55       0.7136      2.01  |       Q |         |    V    |         |
14+ 0       0.7272      1.98  |      Q  |         |    V    |         |
14+ 5       0.7416      2.09  |       Q |         |     V   |         |
14+10       0.7579      2.37  |        Q|         |     V   |         |
14+15       0.7750      2.47  |        Q|         |      V  |         |
14+20       0.7921      2.49  |        Q|         |       V |         |
14+25       0.8089      2.45  |        Q|         |       V |         |
14+30       0.8258      2.45  |        Q|         |        V|         |
14+35       0.8427      2.45  |        Q|         |        V|         |
14+40       0.8596      2.46  |        Q|         |         V         |
14+45       0.8766      2.46  |        Q|         |         |V        |
14+50       0.8934      2.44  |        Q|         |         |V        |
14+55       0.9097      2.37  |        Q|         |         | V       |
15+ 0       0.9259      2.36  |        Q|         |         | V       |
15+ 5       0.9419      2.32  |        Q|         |         |  V      |
15+10       0.9574      2.25  |       Q |         |         |  V      |
15+15       0.9727      2.23  |       Q |         |         |   V     |
15+20       0.9878      2.19  |       Q |         |         |   V     |
15+25       1.0024      2.12  |       Q |         |         |    V    |
15+30       1.0169      2.10  |       Q |         |         |     V   |
15+35       1.0304      1.97  |      Q  |         |         |     V   |
15+40       1.0419      1.67  |     Q   |         |         |     V   |
15+45       1.0528      1.58  |     Q   |         |         |      V  |
15+50       1.0635      1.55  |     Q   |         |         |      V  |
15+55       1.0740      1.53  |     Q   |         |         |       V |
16+ 0       1.0845      1.52  |     Q   |         |         |       V |
16+ 5       1.0928      1.21  |   Q     |         |         |       V |
16+10       1.0963      0.50  | Q       |         |         |       V |
16+15       1.0982      0.29  |Q        |         |         |       V |
16+20       1.0995      0.19  Q         |         |         |       V |
16+25       1.1005      0.13  Q         |         |         |       V |
```

16+30	1.1011	0.10	Q	|	|	|	V |
16+35	1.1016	0.07	Q	|	|	|	V|
16+40	1.1020	0.05	Q	|	|	|	V|
16+45	1.1023	0.05	Q	|	|	|	V|
16+50	1.1026	0.05	Q	|	|	|	V|
16+55	1.1030	0.05	Q	|	|	|	V|
17+ 0	1.1033	0.05	Q	|	|	|	V|
17+ 5	1.1036	0.05	Q	|	|	|	V|
17+10	1.1041	0.07	Q	|	|	|	V|
17+15	1.1046	0.07	Q	|	|	|	V|
17+20	1.1051	0.07	Q	|	|	|	V|
17+25	1.1056	0.07	Q	|	|	|	V|
17+30	1.1061	0.08	Q	|	|	|	V|
17+35	1.1067	0.08	Q	|	|	|	V|
17+40	1.1072	0.08	Q	|	|	|	V|
17+45	1.1077	0.08	Q	|	|	|	V|
17+50	1.1082	0.07	Q	|	|	|	V|
17+55	1.1087	0.07	Q	|	|	|	V|
18+ 0	1.1091	0.06	Q	|	|	|	V|
18+ 5	1.1095	0.06	Q	|	|	|	V|
18+10	1.1100	0.06	Q	|	|	|	V|
18+15	1.1104	0.06	Q	|	|	|	V|
18+20	1.1108	0.06	Q	|	|	|	V|
18+25	1.1112	0.06	Q	|	|	|	V|
18+30	1.1116	0.06	Q	|	|	|	V|
18+35	1.1120	0.06	Q	|	|	|	V|
18+40	1.1124	0.05	Q	|	|	|	V|
18+45	1.1127	0.05	Q	|	|	|	V|
18+50	1.1130	0.04	Q	|	|	|	V|
18+55	1.1133	0.04	Q	|	|	|	V|
19+ 0	1.1135	0.03	Q	|	|	|	V|
19+ 5	1.1137	0.04	Q	|	|	|	V|
19+10	1.1140	0.04	Q	|	|	|	V|
19+15	1.1143	0.04	Q	|	|	|	V|
19+20	1.1147	0.05	Q	|	|	|	V|
19+25	1.1150	0.06	Q	|	|	|	V|
19+30	1.1154	0.06	Q	|	|	|	V|
19+35	1.1158	0.06	Q	|	|	|	V|
19+40	1.1162	0.05	Q	|	|	|	V|
19+45	1.1165	0.05	Q	|	|	|	V|
19+50	1.1168	0.04	Q	|	|	|	V|
19+55	1.1170	0.04	Q	|	|	|	V|
20+ 0	1.1173	0.03	Q	|	|	|	V|
20+ 5	1.1175	0.04	Q	|	|	|	V|
20+10	1.1178	0.04	Q	|	|	|	V|
20+15	1.1181	0.04	Q	|	|	|	V|
20+20	1.1184	0.04	Q	|	|	|	V|
20+25	1.1187	0.04	Q	|	|	|	V|
20+30	1.1190	0.05	Q	|	|	|	V|
20+35	1.1194	0.05	Q	|	|	|	V|
20+40	1.1197	0.05	Q	|	|	|	V|
20+45	1.1200	0.05	Q	|	|	|	V|
20+50	1.1203	0.04	Q	|	|	|	V|
20+55	1.1205	0.04	Q	|	|	|	V|
21+ 0	1.1207	0.03	Q	|	|	|	V|
21+ 5	1.1210	0.04	Q	|	|	|	V|

21+10	1.1213	0.04	Q	|	|	|	V|
21+15	1.1216	0.04	Q	|	|	|	V|
21+20	1.1219	0.04	Q	|	|	|	V|
21+25	1.1221	0.03	Q	|	|	|	V|
21+30	1.1223	0.03	Q	|	|	|	V|
21+35	1.1226	0.03	Q	|	|	|	V|
21+40	1.1228	0.04	Q	|	|	|	V|
21+45	1.1231	0.04	Q	|	|	|	V|
21+50	1.1234	0.04	Q	|	|	|	V|
21+55	1.1237	0.03	Q	|	|	|	V|
22+ 0	1.1239	0.03	Q	|	|	|	V|
22+ 5	1.1241	0.03	Q	|	|	|	V|
22+10	1.1244	0.04	Q	|	|	|	V|
22+15	1.1247	0.04	Q	|	|	|	V|
22+20	1.1250	0.04	Q	|	|	|	V|
22+25	1.1252	0.03	Q	|	|	|	V|
22+30	1.1255	0.03	Q	|	|	|	V|
22+35	1.1257	0.03	Q	|	|	|	V|
22+40	1.1259	0.03	Q	|	|	|	V|
22+45	1.1261	0.03	Q	|	|	|	V|
22+50	1.1263	0.03	Q	|	|	|	V|
22+55	1.1265	0.03	Q	|	|	|	V|
23+ 0	1.1267	0.03	Q	|	|	|	V|
23+ 5	1.1270	0.03	Q	|	|	|	V|
23+10	1.1272	0.03	Q	|	|	|	V|
23+15	1.1274	0.03	Q	|	|	|	V|
23+20	1.1276	0.03	Q	|	|	|	V|
23+25	1.1278	0.03	Q	|	|	|	V|
23+30	1.1280	0.03	Q	|	|	|	V|
23+35	1.1282	0.03	Q	|	|	|	V|
23+40	1.1284	0.03	Q	|	|	|	V|
23+45	1.1286	0.03	Q	|	|	|	V|
23+50	1.1288	0.03	Q	|	|	|	V|
23+55	1.1291	0.03	Q	|	|	|	V|
24+ 0	1.1293	0.03	Q	|	|	|	V|
24+ 5	1.1294	0.02	Q	|	|	|	V|
24+10	1.1295	0.01	Q	|	|	|	V|
24+15	1.1295	0.00	Q	|	|	|	V|
24+20	1.1295	0.00	Q	|	|	|	V|
24+25	1.1296	0.00	Q	|	|	|	V|
24+30	1.1296	0.00	Q	|	|	|	V|
24+35	1.1296	0.00	Q	|	|	|	V

U n i t   H y d r o g r a p h   A n a l y s i s

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Study date 01/08/20 File: Enchanteddev242.out

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Riverside County Synthetic Unit Hydrology Method
RCFC & WCD Manual date - April 1978

Program License Serial Number 4011

English (in-lb) Input Units Used
English Rainfall Data (Inches) Input Values Used

English Units used in output format

Enchanted Hills Park Developed Condition 2 year 24 hr

Drainage Area = 18.90(Ac.) = 0.030 Sq. Mi.
Drainage Area for Depth-Area Areal Adjustment = 18.90(Ac.) = 0.030 Sq. Mi.
Length along longest watercourse = 1280.00(Ft.)
Length along longest watercourse measured to centroid = 780.00(Ft.)
Length along longest watercourse = 0.242 Mi.
Length along longest watercourse measured to centroid = 0.148 Mi.
Difference in elevation = 35.00(Ft.)
Slope along watercourse = 144.3750 Ft./Mi.
Average Manning's 'N' = 0.025
Lag time = 0.066 Hr.
Lag time = 3.95 Min.
25% of lag time = 0.99 Min.
40% of lag time = 1.58 Min.
Unit time = 5.00 Min.
Duration of storm = 24 Hour(s)
User Entered Base Flow = 0.00(CFS)

2 YEAR Area rainfall data:

Area(Ac.)[1]	Rainfall(In)[2]	Weighting[1*2]
18.90	2.00	37.80

100 YEAR Area rainfall data:

```
Area(Ac.)[1]        Rainfall(In)[2]      Weighting[1*2]
      18.90             5.50              103.95
```

STORM EVENT (YEAR) = 2.00

```
Area Averaged 2-Year Rainfall =    2.000(In)
Area Averaged 100-Year Rainfall =    5.500(In)

Point rain (area averaged) =    2.000(In)
Areal adjustment factor =  100.00 %
Adjusted average point rain =    2.000(In)

Sub-Area Data:
Area(Ac.)         Runoff Index   Impervious %
     6.330           93.00          1.000
     2.510           56.00          0.150
    10.060           69.00          0.300
 Total Area Entered =     18.90(Ac.)


RI    RI   Infil. Rate Impervious   Adj. Infil. Rate  Area%     F
AMC2 AMC-2     (In/Hr)    (Dec.%)      (In/Hr)       (Dec.)    (In/Hr)
93.0  93.0      0.091     1.000         0.009       0.335      0.003
56.0  56.0      0.511     0.150         0.442       0.133      0.059
69.0  69.0      0.373     0.300         0.272       0.532      0.145
                                                    Sum (F) =   0.207
Area averaged mean soil loss (F) (In/Hr) =  0.207
Minimum soil loss rate ((In/Hr)) =  0.103
(for 24 hour storm duration)
Soil low loss rate (decimal) =   0.640
---------------------------------------------------------------------

             U n i t  H y d r o g r a p h
                    VALLEY S-Curve
--------------------------------------------------------------------
             Unit Hydrograph Data
---------------------------------------------------------------------
Unit time period   Time % of lag   Distribution   Unit Hydrograph
    (hrs)                            Graph %           (CFS)
---------------------------------------------------------------------
    1   0.083        126.601          27.081              5.158
    2   0.167        253.202          48.459              9.230
    3   0.250        379.803          12.761              2.431
    4   0.333        506.404           5.733              1.092
    5   0.417        633.005           3.174              0.605
    6   0.500        759.606           1.751              0.334
    7   0.583        886.207           1.042              0.198
                               Sum = 100.000   Sum=      19.048
----------------------------------------------------------------------
```

```
The following loss rate calculations reflect use of the minimum calculated loss
rate subtracted from the Storm Rain to produce the maximum Effective Rain value

 Unit Time   Pattern   Storm Rain     Loss rate(In./Hr)     Effective
     (Hr.)  Percent    (In/Hr)         Max    |   Low         (In/Hr)
```

1	0.08	0.07	0.016	(0.366)	0.010	0.006
2	0.17	0.07	0.016	(0.365)	0.010	0.006
3	0.25	0.07	0.016	(0.363)	0.010	0.006
4	0.33	0.10	0.024	(0.362)	0.015	0.009
5	0.42	0.10	0.024	(0.361)	0.015	0.009
6	0.50	0.10	0.024	(0.359)	0.015	0.009
7	0.58	0.10	0.024	(0.358)	0.015	0.009
8	0.67	0.10	0.024	(0.356)	0.015	0.009
9	0.75	0.10	0.024	(0.355)	0.015	0.009
10	0.83	0.13	0.032	(0.354)	0.020	0.012
11	0.92	0.13	0.032	(0.352)	0.020	0.012
12	1.00	0.13	0.032	(0.351)	0.020	0.012
13	1.08	0.10	0.024	(0.349)	0.015	0.009
14	1.17	0.10	0.024	(0.348)	0.015	0.009
15	1.25	0.10	0.024	(0.347)	0.015	0.009
16	1.33	0.10	0.024	(0.345)	0.015	0.009
17	1.42	0.10	0.024	(0.344)	0.015	0.009
18	1.50	0.10	0.024	(0.343)	0.015	0.009
19	1.58	0.10	0.024	(0.341)	0.015	0.009
20	1.67	0.10	0.024	(0.340)	0.015	0.009
21	1.75	0.10	0.024	(0.338)	0.015	0.009
22	1.83	0.13	0.032	(0.337)	0.020	0.012
23	1.92	0.13	0.032	(0.336)	0.020	0.012
24	2.00	0.13	0.032	(0.334)	0.020	0.012
25	2.08	0.13	0.032	(0.333)	0.020	0.012
26	2.17	0.13	0.032	(0.332)	0.020	0.012
27	2.25	0.13	0.032	(0.330)	0.020	0.012
28	2.33	0.13	0.032	(0.329)	0.020	0.012
29	2.42	0.13	0.032	(0.328)	0.020	0.012
30	2.50	0.13	0.032	(0.326)	0.020	0.012
31	2.58	0.17	0.040	(0.325)	0.026	0.014
32	2.67	0.17	0.040	(0.324)	0.026	0.014
33	2.75	0.17	0.040	(0.322)	0.026	0.014
34	2.83	0.17	0.040	(0.321)	0.026	0.014
35	2.92	0.17	0.040	(0.320)	0.026	0.014
36	3.00	0.17	0.040	(0.318)	0.026	0.014
37	3.08	0.17	0.040	(0.317)	0.026	0.014
38	3.17	0.17	0.040	(0.316)	0.026	0.014
39	3.25	0.17	0.040	(0.314)	0.026	0.014
40	3.33	0.17	0.040	(0.313)	0.026	0.014
41	3.42	0.17	0.040	(0.312)	0.026	0.014
42	3.50	0.17	0.040	(0.310)	0.026	0.014
43	3.58	0.17	0.040	(0.309)	0.026	0.014
44	3.67	0.17	0.040	(0.308)	0.026	0.014
45	3.75	0.17	0.040	(0.307)	0.026	0.014
46	3.83	0.20	0.048	(0.305)	0.031	0.017
47	3.92	0.20	0.048	(0.304)	0.031	0.017
48	4.00	0.20	0.048	(0.303)	0.031	0.017
49	4.08	0.20	0.048	(0.301)	0.031	0.017
50	4.17	0.20	0.048	(0.300)	0.031	0.017
51	4.25	0.20	0.048	(0.299)	0.031	0.017
52	4.33	0.23	0.056	(0.298)	0.036	0.020
53	4.42	0.23	0.056	(0.296)	0.036	0.020
54	4.50	0.23	0.056	(0.295)	0.036	0.020
55	4.58	0.23	0.056	(0.294)	0.036	0.020
56	4.67	0.23	0.056	(0.292)	0.036	0.020

57	4.75	0.23	0.056	(0.291)	0.036	0.020
58	4.83	0.27	0.064	(0.290)	0.041	0.023
59	4.92	0.27	0.064	(0.289)	0.041	0.023
60	5.00	0.27	0.064	(0.287)	0.041	0.023
61	5.08	0.20	0.048	(0.286)	0.031	0.017
62	5.17	0.20	0.048	(0.285)	0.031	0.017
63	5.25	0.20	0.048	(0.284)	0.031	0.017
64	5.33	0.23	0.056	(0.282)	0.036	0.020
65	5.42	0.23	0.056	(0.281)	0.036	0.020
66	5.50	0.23	0.056	(0.280)	0.036	0.020
67	5.58	0.27	0.064	(0.279)	0.041	0.023
68	5.67	0.27	0.064	(0.278)	0.041	0.023
69	5.75	0.27	0.064	(0.276)	0.041	0.023
70	5.83	0.27	0.064	(0.275)	0.041	0.023
71	5.92	0.27	0.064	(0.274)	0.041	0.023
72	6.00	0.27	0.064	(0.273)	0.041	0.023
73	6.08	0.30	0.072	(0.271)	0.046	0.026
74	6.17	0.30	0.072	(0.270)	0.046	0.026
75	6.25	0.30	0.072	(0.269)	0.046	0.026
76	6.33	0.30	0.072	(0.268)	0.046	0.026
77	6.42	0.30	0.072	(0.267)	0.046	0.026
78	6.50	0.30	0.072	(0.265)	0.046	0.026
79	6.58	0.33	0.080	(0.264)	0.051	0.029
80	6.67	0.33	0.080	(0.263)	0.051	0.029
81	6.75	0.33	0.080	(0.262)	0.051	0.029
82	6.83	0.33	0.080	(0.261)	0.051	0.029
83	6.92	0.33	0.080	(0.260)	0.051	0.029
84	7.00	0.33	0.080	(0.258)	0.051	0.029
85	7.08	0.33	0.080	(0.257)	0.051	0.029
86	7.17	0.33	0.080	(0.256)	0.051	0.029
87	7.25	0.33	0.080	(0.255)	0.051	0.029
88	7.33	0.37	0.088	(0.254)	0.056	0.032
89	7.42	0.37	0.088	(0.253)	0.056	0.032
90	7.50	0.37	0.088	(0.251)	0.056	0.032
91	7.58	0.40	0.096	(0.250)	0.061	0.035
92	7.67	0.40	0.096	(0.249)	0.061	0.035
93	7.75	0.40	0.096	(0.248)	0.061	0.035
94	7.83	0.43	0.104	(0.247)	0.067	0.037
95	7.92	0.43	0.104	(0.246)	0.067	0.037
96	8.00	0.43	0.104	(0.244)	0.067	0.037
97	8.08	0.50	0.120	(0.243)	0.077	0.043
98	8.17	0.50	0.120	(0.242)	0.077	0.043
99	8.25	0.50	0.120	(0.241)	0.077	0.043
100	8.33	0.50	0.120	(0.240)	0.077	0.043
101	8.42	0.50	0.120	(0.239)	0.077	0.043
102	8.50	0.50	0.120	(0.238)	0.077	0.043
103	8.58	0.53	0.128	(0.237)	0.082	0.046
104	8.67	0.53	0.128	(0.235)	0.082	0.046
105	8.75	0.53	0.128	(0.234)	0.082	0.046
106	8.83	0.57	0.136	(0.233)	0.087	0.049
107	8.92	0.57	0.136	(0.232)	0.087	0.049
108	9.00	0.57	0.136	(0.231)	0.087	0.049
109	9.08	0.63	0.152	(0.230)	0.097	0.055
110	9.17	0.63	0.152	(0.229)	0.097	0.055
111	9.25	0.63	0.152	(0.228)	0.097	0.055
112	9.33	0.67	0.160	(0.227)	0.102	0.058

113	9.42	0.67	0.160	(0.226)	0.102	0.058
114	9.50	0.67	0.160	(0.225)	0.102	0.058
115	9.58	0.70	0.168	(0.223)	0.108	0.060
116	9.67	0.70	0.168	(0.222)	0.108	0.060
117	9.75	0.70	0.168	(0.221)	0.108	0.060
118	9.83	0.73	0.176	(0.220)	0.113	0.063
119	9.92	0.73	0.176	(0.219)	0.113	0.063
120	10.00	0.73	0.176	(0.218)	0.113	0.063
121	10.08	0.50	0.120	(0.217)	0.077	0.043
122	10.17	0.50	0.120	(0.216)	0.077	0.043
123	10.25	0.50	0.120	(0.215)	0.077	0.043
124	10.33	0.50	0.120	(0.214)	0.077	0.043
125	10.42	0.50	0.120	(0.213)	0.077	0.043
126	10.50	0.50	0.120	(0.212)	0.077	0.043
127	10.58	0.67	0.160	(0.211)	0.102	0.058
128	10.67	0.67	0.160	(0.210)	0.102	0.058
129	10.75	0.67	0.160	(0.209)	0.102	0.058
130	10.83	0.67	0.160	(0.208)	0.102	0.058
131	10.92	0.67	0.160	(0.207)	0.102	0.058
132	11.00	0.67	0.160	(0.206)	0.102	0.058
133	11.08	0.63	0.152	(0.205)	0.097	0.055
134	11.17	0.63	0.152	(0.204)	0.097	0.055
135	11.25	0.63	0.152	(0.203)	0.097	0.055
136	11.33	0.63	0.152	(0.202)	0.097	0.055
137	11.42	0.63	0.152	(0.201)	0.097	0.055
138	11.50	0.63	0.152	(0.200)	0.097	0.055
139	11.58	0.57	0.136	(0.199)	0.087	0.049
140	11.67	0.57	0.136	(0.198)	0.087	0.049
141	11.75	0.57	0.136	(0.197)	0.087	0.049
142	11.83	0.60	0.144	(0.196)	0.092	0.052
143	11.92	0.60	0.144	(0.195)	0.092	0.052
144	12.00	0.60	0.144	(0.194)	0.092	0.052
145	12.08	0.83	0.200	(0.193)	0.128	0.072
146	12.17	0.83	0.200	(0.192)	0.128	0.072
147	12.25	0.83	0.200	(0.191)	0.128	0.072
148	12.33	0.87	0.208	(0.190)	0.133	0.075
149	12.42	0.87	0.208	(0.189)	0.133	0.075
150	12.50	0.87	0.208	(0.188)	0.133	0.075
151	12.58	0.93	0.224	(0.187)	0.143	0.081
152	12.67	0.93	0.224	(0.186)	0.143	0.081
153	12.75	0.93	0.224	(0.185)	0.143	0.081
154	12.83	0.97	0.232	(0.184)	0.148	0.084
155	12.92	0.97	0.232	(0.183)	0.148	0.084
156	13.00	0.97	0.232	(0.182)	0.148	0.084
157	13.08	1.13	0.272	(0.182)	0.174	0.098
158	13.17	1.13	0.272	(0.181)	0.174	0.098
159	13.25	1.13	0.272	(0.180)	0.174	0.098
160	13.33	1.13	0.272	(0.179)	0.174	0.098
161	13.42	1.13	0.272	(0.178)	0.174	0.098
162	13.50	1.13	0.272	(0.177)	0.174	0.098
163	13.58	0.77	0.184	(0.176)	0.118	0.066
164	13.67	0.77	0.184	(0.175)	0.118	0.066
165	13.75	0.77	0.184	(0.174)	0.118	0.066
166	13.83	0.77	0.184	(0.173)	0.118	0.066
167	13.92	0.77	0.184	(0.172)	0.118	0.066
168	14.00	0.77	0.184	(0.172)	0.118	0.066

169	14.08	0.90	0.216	(0.171)	0.138	0.078
170	14.17	0.90	0.216	(0.170)	0.138	0.078
171	14.25	0.90	0.216	(0.169)	0.138	0.078
172	14.33	0.87	0.208	(0.168)	0.133	0.075
173	14.42	0.87	0.208	(0.167)	0.133	0.075
174	14.50	0.87	0.208	(0.166)	0.133	0.075
175	14.58	0.87	0.208	(0.166)	0.133	0.075
176	14.67	0.87	0.208	(0.165)	0.133	0.075
177	14.75	0.87	0.208	(0.164)	0.133	0.075
178	14.83	0.83	0.200	(0.163)	0.128	0.072
179	14.92	0.83	0.200	(0.162)	0.128	0.072
180	15.00	0.83	0.200	(0.161)	0.128	0.072
181	15.08	0.80	0.192	(0.161)	0.123	0.069
182	15.17	0.80	0.192	(0.160)	0.123	0.069
183	15.25	0.80	0.192	(0.159)	0.123	0.069
184	15.33	0.77	0.184	(0.158)	0.118	0.066
185	15.42	0.77	0.184	(0.157)	0.118	0.066
186	15.50	0.77	0.184	(0.156)	0.118	0.066
187	15.58	0.63	0.152	(0.156)	0.097	0.055
188	15.67	0.63	0.152	(0.155)	0.097	0.055
189	15.75	0.63	0.152	(0.154)	0.097	0.055
190	15.83	0.63	0.152	(0.153)	0.097	0.055
191	15.92	0.63	0.152	(0.152)	0.097	0.055
192	16.00	0.63	0.152	(0.152)	0.097	0.055
193	16.08	0.13	0.032	(0.151)	0.020	0.012
194	16.17	0.13	0.032	(0.150)	0.020	0.012
195	16.25	0.13	0.032	(0.149)	0.020	0.012
196	16.33	0.13	0.032	(0.149)	0.020	0.012
197	16.42	0.13	0.032	(0.148)	0.020	0.012
198	16.50	0.13	0.032	(0.147)	0.020	0.012
199	16.58	0.10	0.024	(0.146)	0.015	0.009
200	16.67	0.10	0.024	(0.146)	0.015	0.009
201	16.75	0.10	0.024	(0.145)	0.015	0.009
202	16.83	0.10	0.024	(0.144)	0.015	0.009
203	16.92	0.10	0.024	(0.143)	0.015	0.009
204	17.00	0.10	0.024	(0.143)	0.015	0.009
205	17.08	0.17	0.040	(0.142)	0.026	0.014
206	17.17	0.17	0.040	(0.141)	0.026	0.014
207	17.25	0.17	0.040	(0.141)	0.026	0.014
208	17.33	0.17	0.040	(0.140)	0.026	0.014
209	17.42	0.17	0.040	(0.139)	0.026	0.014
210	17.50	0.17	0.040	(0.138)	0.026	0.014
211	17.58	0.17	0.040	(0.138)	0.026	0.014
212	17.67	0.17	0.040	(0.137)	0.026	0.014
213	17.75	0.17	0.040	(0.136)	0.026	0.014
214	17.83	0.13	0.032	(0.136)	0.020	0.012
215	17.92	0.13	0.032	(0.135)	0.020	0.012
216	18.00	0.13	0.032	(0.134)	0.020	0.012
217	18.08	0.13	0.032	(0.134)	0.020	0.012
218	18.17	0.13	0.032	(0.133)	0.020	0.012
219	18.25	0.13	0.032	(0.132)	0.020	0.012
220	18.33	0.13	0.032	(0.132)	0.020	0.012
221	18.42	0.13	0.032	(0.131)	0.020	0.012
222	18.50	0.13	0.032	(0.130)	0.020	0.012
223	18.58	0.10	0.024	(0.130)	0.015	0.009
224	18.67	0.10	0.024	(0.129)	0.015	0.009

225	18.75	0.10	0.024	(0.129)	0.015	0.009
226	18.83	0.07	0.016	(0.128)	0.010	0.006
227	18.92	0.07	0.016	(0.127)	0.010	0.006
228	19.00	0.07	0.016	(0.127)	0.010	0.006
229	19.08	0.10	0.024	(0.126)	0.015	0.009
230	19.17	0.10	0.024	(0.126)	0.015	0.009
231	19.25	0.10	0.024	(0.125)	0.015	0.009
232	19.33	0.13	0.032	(0.124)	0.020	0.012
233	19.42	0.13	0.032	(0.124)	0.020	0.012
234	19.50	0.13	0.032	(0.123)	0.020	0.012
235	19.58	0.10	0.024	(0.123)	0.015	0.009
236	19.67	0.10	0.024	(0.122)	0.015	0.009
237	19.75	0.10	0.024	(0.122)	0.015	0.009
238	19.83	0.07	0.016	(0.121)	0.010	0.006
239	19.92	0.07	0.016	(0.120)	0.010	0.006
240	20.00	0.07	0.016	(0.120)	0.010	0.006
241	20.08	0.10	0.024	(0.119)	0.015	0.009
242	20.17	0.10	0.024	(0.119)	0.015	0.009
243	20.25	0.10	0.024	(0.118)	0.015	0.009
244	20.33	0.10	0.024	(0.118)	0.015	0.009
245	20.42	0.10	0.024	(0.117)	0.015	0.009
246	20.50	0.10	0.024	(0.117)	0.015	0.009
247	20.58	0.10	0.024	(0.116)	0.015	0.009
248	20.67	0.10	0.024	(0.116)	0.015	0.009
249	20.75	0.10	0.024	(0.115)	0.015	0.009
250	20.83	0.07	0.016	(0.115)	0.010	0.006
251	20.92	0.07	0.016	(0.114)	0.010	0.006
252	21.00	0.07	0.016	(0.114)	0.010	0.006
253	21.08	0.10	0.024	(0.114)	0.015	0.009
254	21.17	0.10	0.024	(0.113)	0.015	0.009
255	21.25	0.10	0.024	(0.113)	0.015	0.009
256	21.33	0.07	0.016	(0.112)	0.010	0.006
257	21.42	0.07	0.016	(0.112)	0.010	0.006
258	21.50	0.07	0.016	(0.111)	0.010	0.006
259	21.58	0.10	0.024	(0.111)	0.015	0.009
260	21.67	0.10	0.024	(0.111)	0.015	0.009
261	21.75	0.10	0.024	(0.110)	0.015	0.009
262	21.83	0.07	0.016	(0.110)	0.010	0.006
263	21.92	0.07	0.016	(0.109)	0.010	0.006
264	22.00	0.07	0.016	(0.109)	0.010	0.006
265	22.08	0.10	0.024	(0.109)	0.015	0.009
266	22.17	0.10	0.024	(0.108)	0.015	0.009
267	22.25	0.10	0.024	(0.108)	0.015	0.009
268	22.33	0.07	0.016	(0.108)	0.010	0.006
269	22.42	0.07	0.016	(0.107)	0.010	0.006
270	22.50	0.07	0.016	(0.107)	0.010	0.006
271	22.58	0.07	0.016	(0.107)	0.010	0.006
272	22.67	0.07	0.016	(0.106)	0.010	0.006
273	22.75	0.07	0.016	(0.106)	0.010	0.006
274	22.83	0.07	0.016	(0.106)	0.010	0.006
275	22.92	0.07	0.016	(0.106)	0.010	0.006
276	23.00	0.07	0.016	(0.105)	0.010	0.006
277	23.08	0.07	0.016	(0.105)	0.010	0.006
278	23.17	0.07	0.016	(0.105)	0.010	0.006
279	23.25	0.07	0.016	(0.105)	0.010	0.006
280	23.33	0.07	0.016	(0.104)	0.010	0.006

281	23.42	0.07	0.016	(0.104)	0.010	0.006
282	23.50	0.07	0.016	(0.104)	0.010	0.006
283	23.58	0.07	0.016	(0.104)	0.010	0.006
284	23.67	0.07	0.016	(0.104)	0.010	0.006
285	23.75	0.07	0.016	(0.104)	0.010	0.006
286	23.83	0.07	0.016	(0.103)	0.010	0.006
287	23.92	0.07	0.016	(0.103)	0.010	0.006
288	24.00	0.07	0.016	(0.103)	0.010	0.006

(Loss Rate Not Used)

Sum = 100.0 Sum = 8.6

Flood volume = Effective rainfall 0.72(In)
times area 18.9(Ac.)/[(In)/(Ft.)] = 1.1(Ac.Ft)
Total soil loss = 1.28(In)
Total soil loss = 2.016(Ac.Ft)
Total rainfall = 2.00(In)
Flood volume = 49395.2 Cubic Feet
Total soil loss = 87813.7 Cubic Feet

Peak flow rate of this hydrograph = 1.863(CFS)

+++

24 - H O U R S T O R M
R u n o f f H y d r o g r a p h

Hydrograph in 5 Minute intervals ((CFS))

Time(h+m)	Volume Ac.Ft	Q(CFS)	0	2.5	5.0	7.5	10.0
0+ 5	0.0002	0.03	Q	|	|	|	|
0+10	0.0008	0.08	Q	|	|	|	|
0+15	0.0014	0.10	Q	|	|	|	|
0+20	0.0023	0.12	Q	|	|	|	|
0+25	0.0033	0.15	Q	|	|	|	|
0+30	0.0044	0.16	Q	|	|	|	|
0+35	0.0055	0.16	Q	|	|	|	|
0+40	0.0066	0.16	Q	|	|	|	|
0+45	0.0077	0.16	Q	|	|	|	|
0+50	0.0090	0.18	Q	|	|	|	|
0+55	0.0104	0.21	Q	|	|	|	|
1+ 0	0.0118	0.21	Q	|	|	|	|
1+ 5	0.0132	0.20	Q	|	|	|	|
1+10	0.0145	0.18	Q	|	|	|	|
1+15	0.0156	0.17	Q	|	|	|	|
1+20	0.0168	0.17	Q	|	|	|	|
1+25	0.0179	0.17	Q	|	|	|	|
1+30	0.0191	0.17	Q	|	|	|	|
1+35	0.0202	0.16	Q	|	|	|	|
1+40	0.0213	0.16	Q	|	|	|	|
1+45	0.0225	0.16	Q	|	|	|	|
1+50	0.0237	0.18	Q	|	|	|	|
1+55	0.0251	0.21	Q	|	|	|	|
2+ 0	0.0266	0.21	Q	|	|	|	|
2+ 5	0.0281	0.22	Q	|	|	|	|
2+10	0.0296	0.22	QV	|	|	|	|
2+15	0.0311	0.22	QV	|	|	|	|

```
 2+20        0.0326      0.22  QV        |         |         |         |
 2+25        0.0341      0.22  QV        |         |         |         |
 2+30        0.0356      0.22  QV        |         |         |         |
 2+35        0.0372      0.23  QV        |         |         |         |
 2+40        0.0390      0.26  |Q        |         |         |         |
 2+45        0.0409      0.27  |Q        |         |         |         |
 2+50        0.0427      0.27  |Q        |         |         |         |
 2+55        0.0446      0.27  |Q        |         |         |         |
 3+ 0        0.0465      0.27  |Q        |         |         |         |
 3+ 5        0.0484      0.27  |Q        |         |         |         |
 3+10        0.0503      0.27  |Q        |         |         |         |
 3+15        0.0522      0.27  |Q        |         |         |         |
 3+20        0.0541      0.27  |Q        |         |         |         |
 3+25        0.0560      0.27  |Q        |         |         |         |
 3+30        0.0579      0.27  |QV       |         |         |         |
 3+35        0.0597      0.27  |QV       |         |         |         |
 3+40        0.0616      0.27  |QV       |         |         |         |
 3+45        0.0635      0.27  |QV       |         |         |         |
 3+50        0.0655      0.29  |QV       |         |         |         |
 3+55        0.0677      0.32  |QV       |         |         |         |
 4+ 0        0.0699      0.32  |QV       |         |         |         |
 4+ 5        0.0722      0.33  |QV       |         |         |         |
 4+10        0.0744      0.33  |QV       |         |         |         |
 4+15        0.0767      0.33  |QV       |         |         |         |
 4+20        0.0791      0.34  |QV       |         |         |         |
 4+25        0.0816      0.37  |QV       |         |         |         |
 4+30        0.0842      0.38  |QV       |         |         |         |
 4+35        0.0868      0.38  |Q V      |         |         |         |
 4+40        0.0895      0.38  |Q V      |         |         |         |
 4+45        0.0921      0.38  |Q V      |         |         |         |
 4+50        0.0949      0.40  |Q V      |         |         |         |
 4+55        0.0978      0.43  |Q V      |         |         |         |
 5+ 0        0.1008      0.43  |Q V      |         |         |         |
 5+ 5        0.1036      0.41  |Q V      |         |         |         |
 5+10        0.1060      0.35  |Q V      |         |         |         |
 5+15        0.1084      0.34  |Q V      |         |         |         |
 5+20        0.1108      0.35  |Q V      |         |         |         |
 5+25        0.1133      0.37  |Q V      |         |         |         |
 5+30        0.1160      0.38  |Q  V     |         |         |         |
 5+35        0.1187      0.40  |Q  V     |         |         |         |
 5+40        0.1216      0.42  |Q  V     |         |         |         |
 5+45        0.1246      0.43  |Q  V     |         |         |         |
 5+50        0.1276      0.44  |Q  V     |         |         |         |
 5+55        0.1306      0.44  |Q  V     |         |         |         |
 6+ 0        0.1336      0.44  |Q  V     |         |         |         |
 6+ 5        0.1367      0.45  |Q  V     |         |         |         |
 6+10        0.1400      0.48  |Q  V     |         |         |         |
 6+15        0.1434      0.49  |Q   V    |         |         |         |
 6+20        0.1468      0.49  |Q   V    |         |         |         |
 6+25        0.1502      0.49  |Q   V    |         |         |         |
 6+30        0.1536      0.49  |Q   V    |         |         |         |
 6+35        0.1571      0.51  | Q  V    |         |         |         |
 6+40        0.1608      0.54  | Q  V    |         |         |         |
 6+45        0.1645      0.54  | Q  V    |         |         |         |
 6+50        0.1683      0.55  | Q  V    |         |         |         |
 6+55        0.1720      0.55  | Q   V   |         |         |         |
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 7+ 0       0.1758      0.55  | Q   V   |         |         |         |
 7+ 5       0.1796      0.55  | Q   V   |         |         |         |
 7+10       0.1834      0.55  | Q   V   |         |         |         |
 7+15       0.1871      0.55  | Q   V   |         |         |         |
 7+20       0.1910      0.56  | Q   V   |         |         |         |
 7+25       0.1951      0.59  | Q   V   |         |         |         |
 7+30       0.1992      0.60  | Q    V  |         |         |         |
 7+35       0.2034      0.62  | Q    V  |         |         |         |
 7+40       0.2079      0.64  | Q    V  |         |         |         |
 7+45       0.2124      0.65  | Q    V  |         |         |         |
 7+50       0.2170      0.67  | Q    V  |         |         |         |
 7+55       0.2218      0.70  | Q    V  |         |         |         |
 8+ 0       0.2267      0.71  | Q    V  |         |         |         |
 8+ 5       0.2318      0.74  | Q     V |         |         |         |
 8+10       0.2372      0.79  |  Q    V |         |         |         |
 8+15       0.2428      0.81  |  Q    V |         |         |         |
 8+20       0.2484      0.82  |  Q    V |         |         |         |
 8+25       0.2541      0.82  |  Q    V |         |         |         |
 8+30       0.2597      0.82  |  Q     V|         |         |         |
 8+35       0.2655      0.84  |  Q     V|         |         |         |
 8+40       0.2715      0.86  |  Q     V|         |         |         |
 8+45       0.2775      0.87  |  Q     V|         |         |         |
 8+50       0.2836      0.89  |  Q      V         |         |         |
 8+55       0.2899      0.92  |  Q      V         |         |         |
 9+ 0       0.2963      0.93  |  Q      V         |         |         |
 9+ 5       0.3029      0.96  |  Q      V         |         |         |
 9+10       0.3099      1.01  |   Q     V         |         |         |
 9+15       0.3170      1.03  |   Q     |V        |         |         |
 9+20       0.3242      1.05  |   Q     |V        |         |         |
 9+25       0.3317      1.08  |   Q     |V        |         |         |
 9+30       0.3392      1.09  |   Q     |V        |         |         |
 9+35       0.3468      1.11  |   Q     | V       |         |         |
 9+40       0.3546      1.14  |   Q     | V       |         |         |
 9+45       0.3625      1.15  |   Q     | V       |         |         |
 9+50       0.3706      1.16  |   Q     |  V      |         |         |
 9+55       0.3788      1.19  |   Q     |  V      |         |         |
10+ 0       0.3870      1.20  |   Q     |  V      |         |         |
10+ 5       0.3946      1.10  |   Q     |  V      |         |         |
10+10       0.4009      0.92  |  Q      |   V     |         |         |
10+15       0.4069      0.87  |  Q      |   V     |         |         |
10+20       0.4127      0.85  |  Q      |   V     |         |         |
10+25       0.4185      0.83  |  Q      |   V     |         |         |
10+30       0.4242      0.83  |  Q      |   V     |         |         |
10+35       0.4303      0.90  |  Q      |    V    |         |         |
10+40       0.4374      1.03  |   Q     |    V    |         |         |
10+45       0.4448      1.07  |   Q     |    V    |         |         |
10+50       0.4522      1.08  |   Q     |    V    |         |         |
10+55       0.4597      1.09  |   Q     |     V   |         |         |
11+ 0       0.4673      1.09  |   Q     |     V   |         |         |
11+ 5       0.4747      1.08  |   Q     |     V   |         |         |
11+10       0.4820      1.06  |   Q     |      V  |         |         |
11+15       0.4892      1.05  |   Q     |      V  |         |         |
11+20       0.4964      1.05  |   Q     |      V  |         |         |
11+25       0.5036      1.04  |   Q     |      V  |         |         |
11+30       0.5108      1.04  |   Q     |       V |         |         |
11+35       0.5178      1.01  |   Q     |       V |         |         |
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11+40       0.5244      0.96  |  Q      |       V |         |         |
11+45       0.5309      0.95  |  Q      |       V |         |         |
11+50       0.5375      0.95  |  Q      |       V |         |         |
11+55       0.5442      0.98  |  Q      |        V|         |         |
12+ 0       0.5510      0.98  |  Q      |        V|         |         |
12+ 5       0.5585      1.09  |   Q     |        V|         |         |
12+10       0.5673      1.28  |    Q    |         V         |         |
12+15       0.5764      1.33  |    Q    |         V         |         |
12+20       0.5858      1.36  |    Q    |         V         |         |
12+25       0.5955      1.40  |    Q    |         |V        |         |
12+30       0.6052      1.42  |    Q    |         |V        |         |
12+35       0.6152      1.45  |    Q    |         |V        |         |
12+40       0.6256      1.51  |     Q   |         | V       |         |
12+45       0.6361      1.52  |     Q   |         | V       |         |
12+50       0.6468      1.55  |     Q   |         | V       |         |
12+55       0.6576      1.58  |     Q   |         |  V      |         |
13+ 0       0.6685      1.58  |     Q   |         |  V      |         |
13+ 5       0.6800      1.66  |     Q   |         |  V      |         |
13+10       0.6923      1.80  |      Q  |         |   V     |         |
13+15       0.7050      1.83  |      Q  |         |   V     |         |
13+20       0.7177      1.85  |      Q  |         |    V    |         |
13+25       0.7305      1.86  |      Q  |         |    V    |         |
13+30       0.7433      1.86  |      Q  |         |     V   |         |
13+35       0.7551      1.70  |     Q   |         |     V   |         |
13+40       0.7648      1.41  |    Q    |         |     V   |         |
13+45       0.7740      1.33  |    Q    |         |      V  |         |
13+50       0.7829      1.30  |    Q    |         |      V  |         |
13+55       0.7917      1.28  |    Q    |         |      V  |         |
14+ 0       0.8004      1.27  |    Q    |         |       V |         |
14+ 5       0.8095      1.32  |    Q    |         |       V |         |
14+10       0.8194      1.43  |    Q    |         |       V |         |
14+15       0.8294      1.46  |    Q    |         |        V|         |
14+20       0.8394      1.45  |    Q    |         |        V|         |
14+25       0.8493      1.43  |    Q    |         |        V|         |
14+30       0.8592      1.43  |    Q    |         |         V         |
14+35       0.8690      1.43  |    Q    |         |         V         |
14+40       0.8788      1.43  |    Q    |         |         |V        |
14+45       0.8887      1.43  |    Q    |         |         |V        |
14+50       0.8984      1.41  |    Q    |         |         |V        |
14+55       0.9079      1.39  |    Q    |         |         | V       |
15+ 0       0.9174      1.38  |    Q    |         |         | V       |
15+ 5       0.9268      1.36  |    Q    |         |         | V       |
15+10       0.9360      1.33  |    Q    |         |         |  V      |
15+15       0.9451      1.32  |    Q    |         |         |  V      |
15+20       0.9541      1.31  |    Q    |         |         |  V      |
15+25       0.9629      1.28  |    Q    |         |         |  V      |
15+30       0.9716      1.27  |    Q    |         |         |   V     |
15+35       0.9799      1.21  |   Q     |         |         |   V     |
15+40       0.9875      1.10  |   Q     |         |         |   V     |
15+45       0.9949      1.07  |   Q     |         |         |    V    |
15+50       1.0021      1.06  |   Q     |         |         |    V    |
15+55       1.0094      1.05  |   Q     |         |         |    V    |
16+ 0       1.0166      1.05  |   Q     |         |         |    V    |
16+ 5       1.0222      0.82  |  Q      |         |         |     V   |
16+10       1.0251      0.42  |Q        |         |         |     V   |
16+15       1.0273      0.32  |Q        |         |         |     V   |
```

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16+20       1.0291      0.27  |Q        |         |         |     V   |
16+25       1.0308      0.24  Q         |         |         |     V   |
16+30       1.0324      0.23  Q         |         |         |     V   |
16+35       1.0338      0.20  Q         |         |         |     V   |
16+40       1.0350      0.18  Q         |         |         |     V   |
16+45       1.0362      0.17  Q         |         |         |     V   |
16+50       1.0373      0.17  Q         |         |         |     V   |
16+55       1.0385      0.17  Q         |         |         |     V   |
17+ 0       1.0396      0.17  Q         |         |         |     V   |
17+ 5       1.0410      0.19  Q         |         |         |     V   |
17+10       1.0427      0.25  Q         |         |         |     V   |
17+15       1.0445      0.26  |Q        |         |         |     V   |
17+20       1.0463      0.27  |Q        |         |         |     V   |
17+25       1.0482      0.27  |Q        |         |         |     V   |
17+30       1.0501      0.27  |Q        |         |         |      V  |
17+35       1.0520      0.27  |Q        |         |         |      V  |
17+40       1.0538      0.27  |Q        |         |         |      V  |
17+45       1.0557      0.27  |Q        |         |         |      V  |
17+50       1.0575      0.26  |Q        |         |         |      V  |
17+55       1.0591      0.23  Q         |         |         |      V  |
18+ 0       1.0607      0.23  Q         |         |         |      V  |
18+ 5       1.0622      0.22  Q         |         |         |      V  |
18+10       1.0637      0.22  Q         |         |         |      V  |
18+15       1.0653      0.22  Q         |         |         |      V  |
18+20       1.0668      0.22  Q         |         |         |      V  |
18+25       1.0683      0.22  Q         |         |         |      V  |
18+30       1.0698      0.22  Q         |         |         |      V  |
18+35       1.0712      0.20  Q         |         |         |      V  |
18+40       1.0724      0.18  Q         |         |         |      V  |
18+45       1.0736      0.17  Q         |         |         |      V  |
18+50       1.0747      0.15  Q         |         |         |      V  |
18+55       1.0755      0.12  Q         |         |         |      V  |
19+ 0       1.0763      0.12  Q         |         |         |      V  |
19+ 5       1.0772      0.13  Q         |         |         |      V  |
19+10       1.0783      0.15  Q         |         |         |       V |
19+15       1.0794      0.16  Q         |         |         |       V |
19+20       1.0806      0.18  Q         |         |         |       V |
19+25       1.0820      0.20  Q         |         |         |       V |
19+30       1.0834      0.21  Q         |         |         |       V |
19+35       1.0848      0.20  Q         |         |         |       V |
19+40       1.0860      0.18  Q         |         |         |       V |
19+45       1.0872      0.17  Q         |         |         |       V |
19+50       1.0883      0.15  Q         |         |         |       V |
19+55       1.0891      0.12  Q         |         |         |       V |
20+ 0       1.0899      0.12  Q         |         |         |       V |
20+ 5       1.0908      0.13  Q         |         |         |       V |
20+10       1.0919      0.15  Q         |         |         |       V |
20+15       1.0930      0.16  Q         |         |         |       V |
20+20       1.0941      0.16  Q         |         |         |       V |
20+25       1.0952      0.16  Q         |         |         |       V |
20+30       1.0963      0.16  Q         |         |         |       V |
20+35       1.0975      0.16  Q         |         |         |       V |
20+40       1.0986      0.16  Q         |         |         |       V |
20+45       1.0997      0.16  Q         |         |         |       V |
20+50       1.1008      0.15  Q         |         |         |       V |
20+55       1.1016      0.12  Q         |         |         |       V |
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  21+ 0      1.1024      0.12  Q          |          |          |        V |
  21+ 5      1.1033      0.13  Q          |          |          |        V |
  21+10      1.1043      0.15  Q          |          |          |        V |
  21+15      1.1054      0.16  Q          |          |          |        V |
  21+20      1.1064      0.15  Q          |          |          |         V|
  21+25      1.1073      0.12  Q          |          |          |         V|
  21+30      1.1081      0.12  Q          |          |          |         V|
  21+35      1.1090      0.13  Q          |          |          |         V|
  21+40      1.1100      0.15  Q          |          |          |         V|
  21+45      1.1111      0.16  Q          |          |          |         V|
  21+50      1.1121      0.15  Q          |          |          |         V|
  21+55      1.1129      0.12  Q          |          |          |         V|
  22+ 0      1.1137      0.12  Q          |          |          |         V|
  22+ 5      1.1146      0.13  Q          |          |          |         V|
  22+10      1.1157      0.15  Q          |          |          |         V|
  22+15      1.1168      0.16  Q          |          |          |         V|
  22+20      1.1178      0.15  Q          |          |          |         V|
  22+25      1.1186      0.12  Q          |          |          |         V|
  22+30      1.1194      0.12  Q          |          |          |         V|
  22+35      1.1202      0.11  Q          |          |          |         V|
  22+40      1.1210      0.11  Q          |          |          |         V|
  22+45      1.1217      0.11  Q          |          |          |         V|
  22+50      1.1225      0.11  Q          |          |          |         V|
  22+55      1.1232      0.11  Q          |          |          |         V|
  23+ 0      1.1240      0.11  Q          |          |          |         V|
  23+ 5      1.1247      0.11  Q          |          |          |         V|
  23+10      1.1255      0.11  Q          |          |          |         V|
  23+15      1.1263      0.11  Q          |          |          |         V|
  23+20      1.1270      0.11  Q          |          |          |         V|
  23+25      1.1278      0.11  Q          |          |          |         V|
  23+30      1.1285      0.11  Q          |          |          |         V|
  23+35      1.1293      0.11  Q          |          |          |         V|
  23+40      1.1300      0.11  Q          |          |          |         V|
  23+45      1.1308      0.11  Q          |          |          |         V|
  23+50      1.1315      0.11  Q          |          |          |         V|
  23+55      1.1323      0.11  Q          |          |          |         V|
  24+ 0      1.1331      0.11  Q          |          |          |         V|
  24+ 5      1.1336      0.08  Q          |          |          |         V|
  24+10      1.1338      0.03  Q          |          |          |         V|
  24+15      1.1339      0.01  Q          |          |          |         V|
  24+20      1.1339      0.01  Q          |          |          |         V|
  24+25      1.1340      0.00  Q          |          |          |         V|
  24+30      1.1340      0.00  Q          |          |          |          V
-----------------------------------------------------------------------
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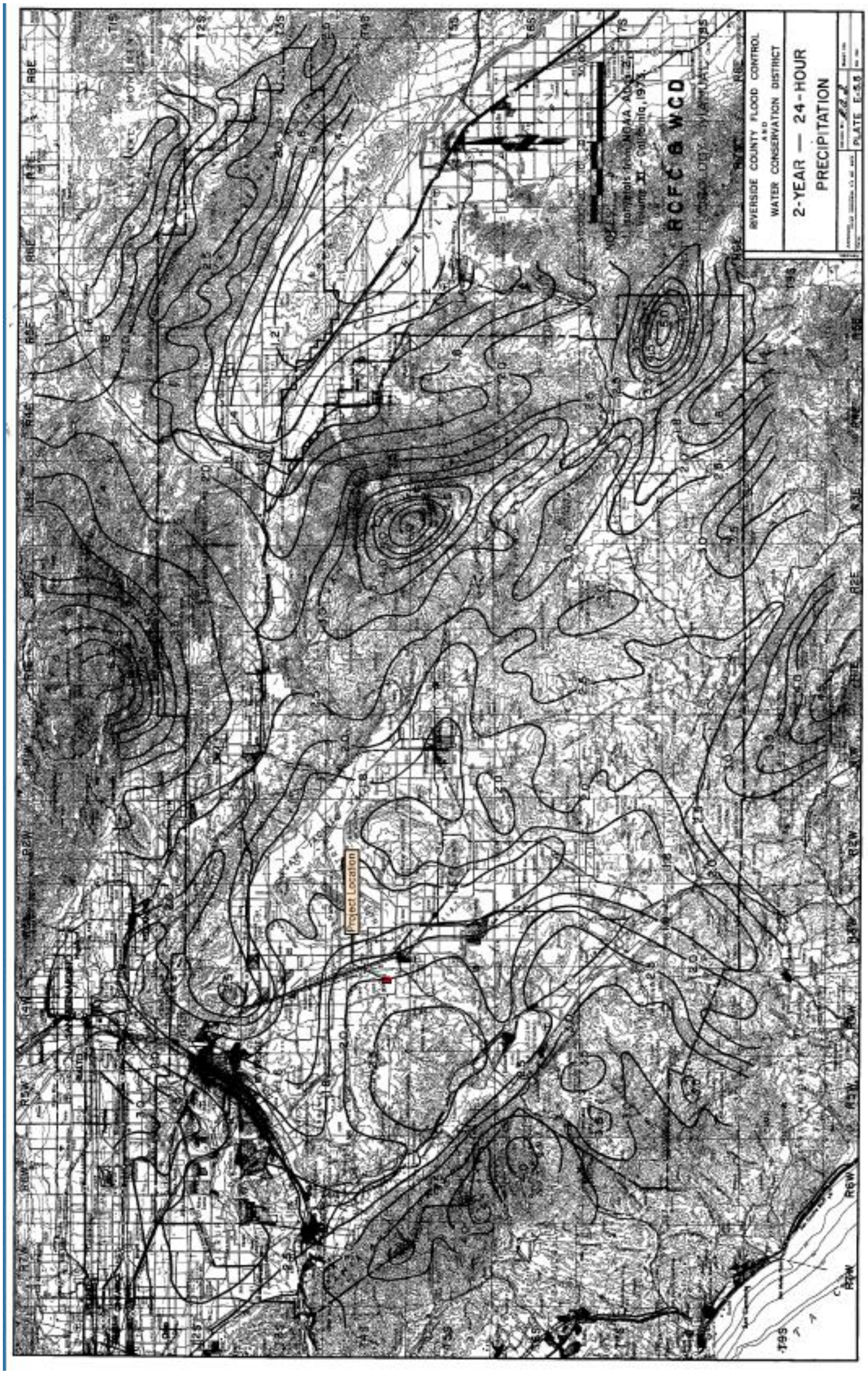
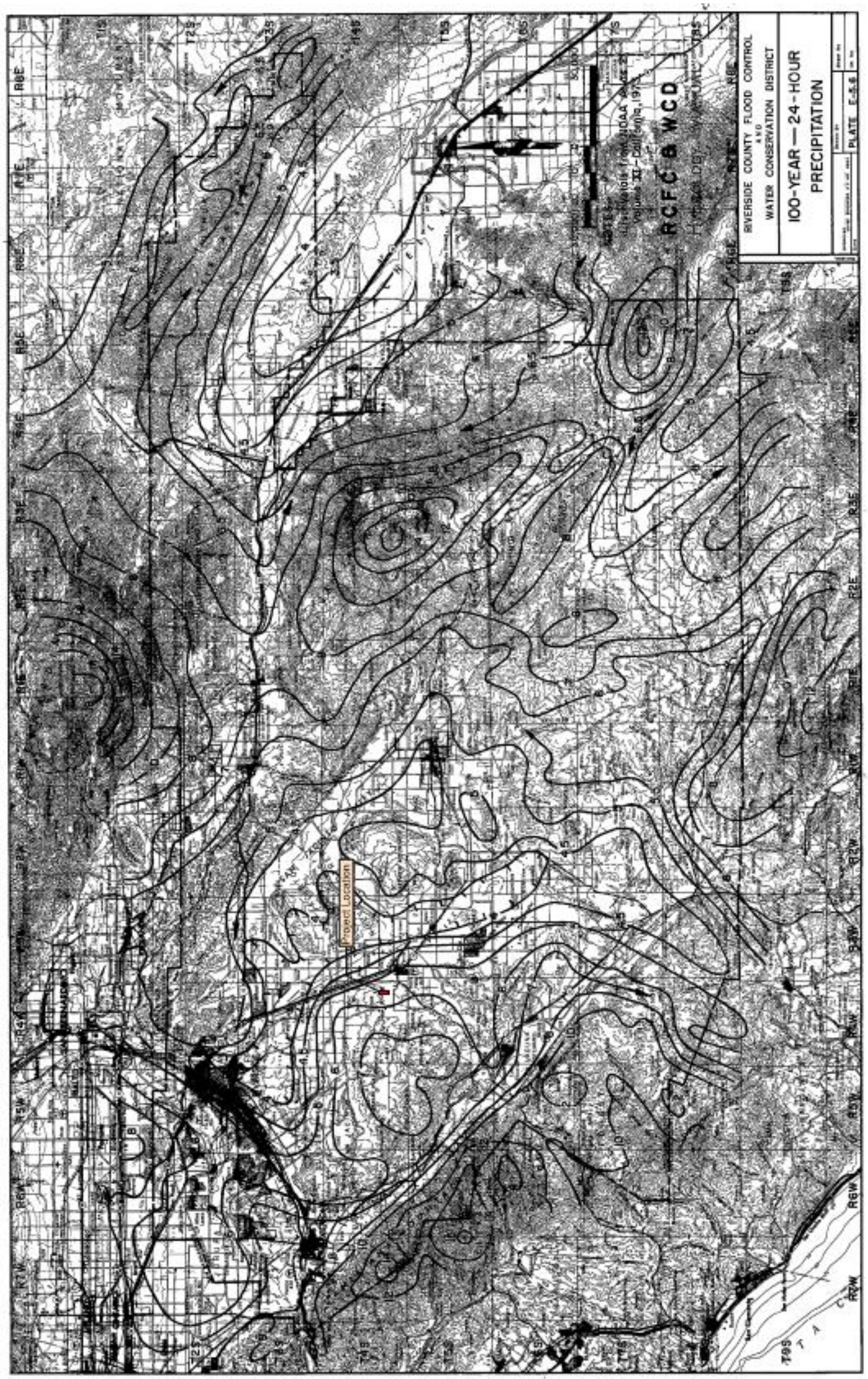

RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
2-YEAR — 24-HOUR PRECIPITATION
PLATE E-5.6
RCFC & WCD
Project Location


Project Location
RCFC & WCD
RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT
100-YEAR — 24-HOUR PRECIPITATION
PLATE E-5.6

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
NATURAL COVERS -					
Barren (Rockland, eroded and graded land) EXISTING DEVELOPED IMPERVIOUS		78	86	91	93
Chaparrel, Broadleaf (Manzonita, ceanothus and scrub oak)	Poor	53	70	80	85
	Fair	40	63	75	81
	Good	31	57	71	78
Chaparrel, Narrowleaf (Chamise and redshank)	Poor	71	82	88	91
	Fair	55	72	81	86
Grass, Annual or Perennial	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Meadows or Cienegas (Areas with seasonally high water table, principal vegetation is sod forming grass)	Poor	63	77	85	88
	Fair	51	70	80	84
	Good	30	58	72	78
Open Brush (Soft wood shrubs - buckwheat, sage, etc.)	Poor	62	76	84	88
	Fair	46	66	77	83
	Good	41	63	75	81
Woodland (Coniferous or broadleaf trees predominate. Canopy density is at least 50 percent)	Poor	45	66	77	83
	Fair	36	60	73	79
	Good	28	55	70	77
Woodland, Grass (Coniferous or broadleaf trees with canopy density from 20 to 50 percent)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
URBAN COVERS -					
Residential or Commercial Landscaping (Lawn, shrubs, etc.) DEVELOPED PERVIOUS	Good	32	56	69	75
Turf (Irrigated and mowed grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
AGRICULTURAL COVERS -					
Fallow (Land plowed but not tilled or seeded)		76	85	90	92

RCFC & WCD
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS FOR PERVIOUS AREAS

PLATE E-6.1 (1 of 2)

RUNOFF INDEX NUMBERS OF HYDROLOGIC SOIL-COVER COMPLEXES FOR PERVIOUS AREAS-AMC II

Cover Type (3)	Quality of Cover (2)	Soil Group A	B	C	D
AGRICULTURAL COVERS (cont.) -					
Legumes, Close Seeded (Alfalfa, sweetclover, timothy, etc.)	Poor	66	77	85	89
	Good	58	72	81	85
Orchards, Deciduous (Apples, apricots, pears, walnuts, etc.)		See Note 4			
Orchards, Evergreen (Citrus, avocados, etc.)	Poor	57	73	82	86
	Fair	44	65	77	82
	Good	33	58	72	79
Pasture, Dryland (Annual grasses)	Poor	67	78	86	89
	Fair	50	69	79	84
	Good	38	61	74	80
Pasture, Irrigated (Legumes and perennial grass)	Poor	58	74	83	87
	Fair	44	65	77	82
	Good	33	58	72	79
Row Crops (Field crops - tomatoes, sugar beets, etc.)	Poor	72	81	88	91
	Good	67	78	85	89
Small Grain (Wheat, oats, barley, etc.)	Poor	65	76	84	88
	Good	63	75	83	87
Vineyard		See Note 4			

Notes:

1. All runoff index (RI) numbers are for Antecedent Moisture Condition (AMC) II.

2. Quality of cover definitions:
   Poor-Heavily grazed or regularly burned areas. Less than 50 percent of the ground surface is protected by plant cover or brush and tree canopy.
   Fair-Moderate cover with 50 percent to 75 percent of the ground surface protected.
   Good-Heavy or dense cover with more than 75 percent of the ground surface protected.

3. See Plate C-2 for a detailed description of cover types.

4. Use runoff index numbers based on ground cover type. See discussion under "Cover Type Descriptions" on Plate C-2.

5. Reference Bibliography item 17.

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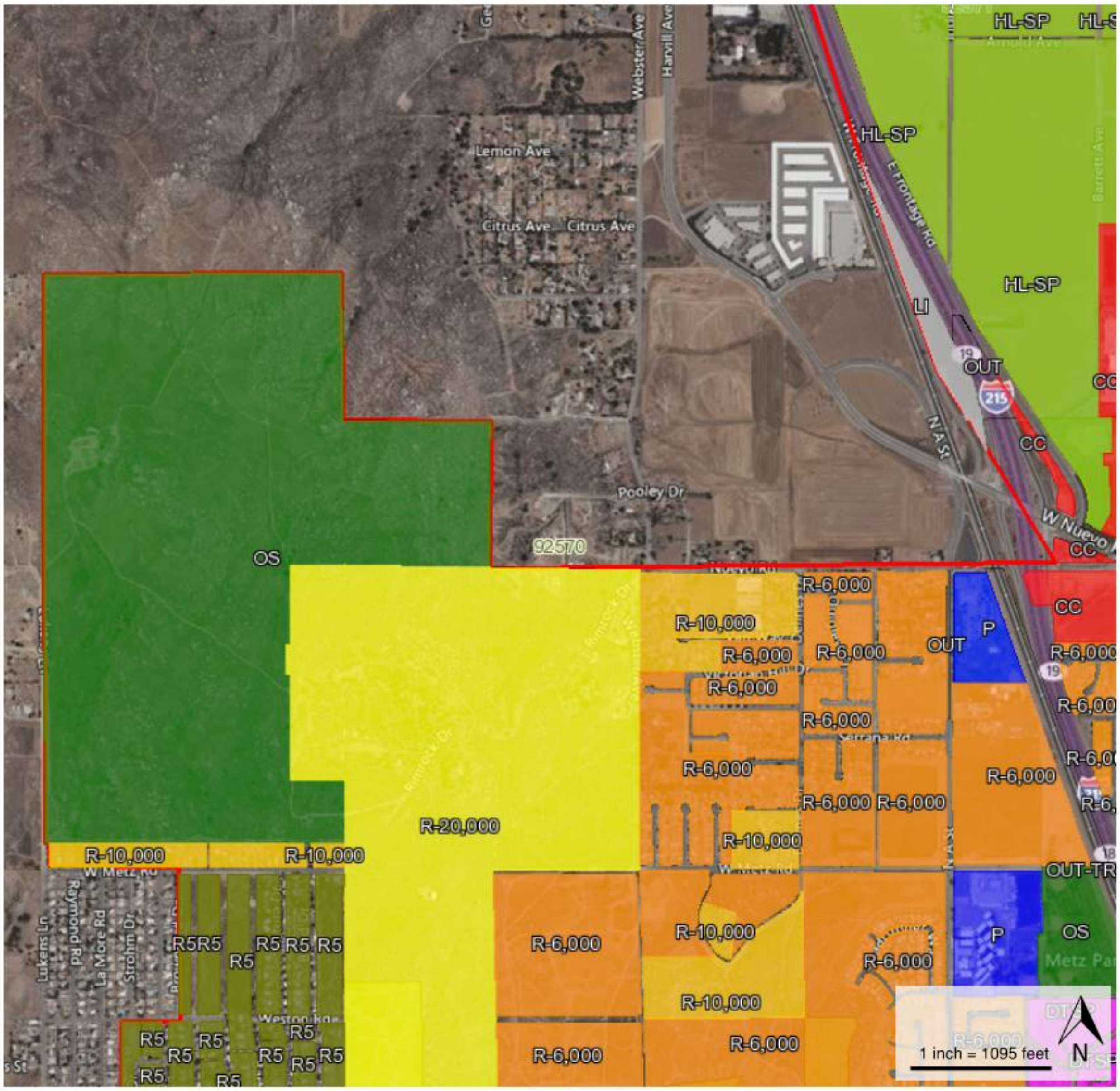
HYDROLOGY MANUAL

RUNOFF INDEX NUMBERS FOR PERVIOUS AREAS

PLATE E-6.1 (2of 2)



Zoning Map

TERMINOLOGY

L = LENGTH OF LONGEST WATERCOURSE.

L_{ca} = LENGTH ALONG LONGEST WATERCOURSE, MEASURED UPSTREAM TO POINT OPPOSITE CENTER OF AREA.

S = OVER-ALL SLOPE OF LONGEST WATERCOURSE BETWEEN HEADWATER AND COLLECTION POINT.

LAG = ELAPSED TIME FROM BEGINNING OF UNIT PRECIPITATION TO INSTANT THAT SUMMATION HYDROGRAPH REACHES 50 % OF ULTIMATE DISCHARGE.

$\bar{n}$ = VISUALLY ESTIMATED MEAN OF THE n (MANNING'S FORMULA) VALUES OF ALL THE CHANNELS WITHIN AN AREA.

GUIDE FOR ESTIMATING BASIN FACTOR ($\bar{n}$)

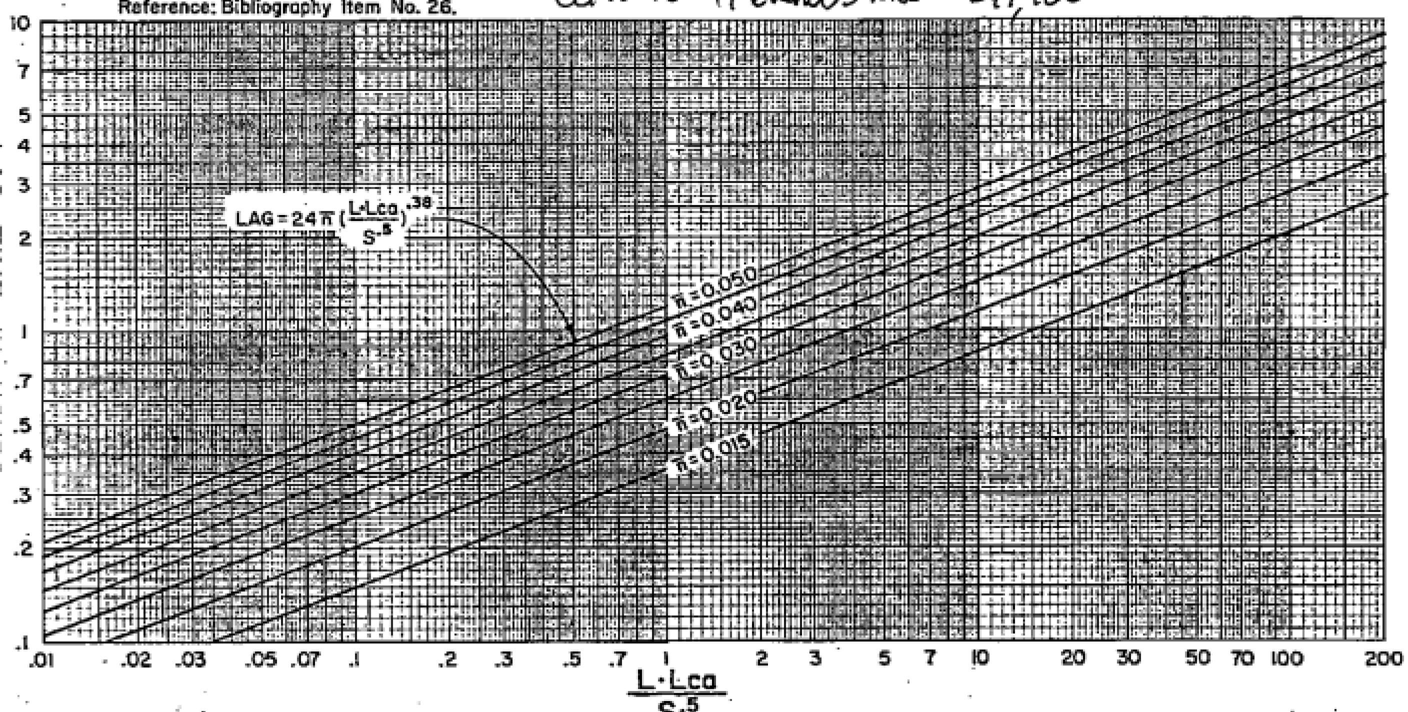
$\bar{n}$=0.050: DRAINAGE AREA IS QUITE RUGGED, WITH SHARP RIDGES AND NARROW, STEEP CANYONS THROUGH WHICH WATERCOURSES MEANDER AROUND SHARP BENDS, OVER LARGE BOULDERS, AND CONSIDERABLE DEBRIS OBSTRUCTION. THE GROUND COVER, EXCLUDING SMALL AREAS OF ROCK OUTCROPS, INCLUDES MANY TREES AND CONSIDERABLE UNDERBRUSH. NO DRAINAGE IMPROVEMENTS EXIST IN THE AREA.

$\bar{n}$=0.030: DRAINAGE AREA IS GENERALLY ROLLING, WITH ROUNDED RIDGES AND MODERATE SIDE SLOPES. WATERCOURSES MEANDER IN FAIRLY STRAIGHT, UNIMPROVED CHANNELS WITH SOME BOULDERS AND LODGED DEBRIS. GROUND COVER INCLUDES SCATTERED BRUSH AND GRASSES. NO DRAINAGE IMPROVEMENTS EXIST IN THE AREA. EXISTING CONDITION

$\bar{n}$=0.015: DRAINAGE AREA HAS FAIRLY UNIFORM, GENTLE SLOPES WITH MOST WATERCOURSES - EITHER IMPROVED OR ALONG PAVED STREETS. GROUND COVER CONSISTS OF SOME GRASSES WITH APPRECIABLE AREAS DEVELOPED TO THE EXTENT THAT A LARGE PERCENTAGE OF THE AREA IS IMPERVIOUS.

DEVELOPED CONDITION | IMPERVIOUS AREA = 276,024 SF @ $\bar{n}$ 0.015 | PERVIOUS AREA = 547,180 SF @ $\bar{n}$ 0.03 $\}$ $\bar{n}$=0.025

Reference: Bibliography Item No. 26.



RCFC & WCD

HYDROLOGY MANUAL

LAG RELATIONSHIPS FOR SOUTHERN CALIFORNIA

PLATE E-3

Appendix 8: Source Control

Pollutant Sources/Source Control Checklist

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

How to use this worksheet (also see instructions in Section G of the WQMP Template):

1. Review Column 1 and identify which of these potential sources of stormwater pollutants apply to your site. Check each box that applies.
2. Review Column 2 and incorporate all of the corresponding applicable BMPs in your WQMP Exhibit.
3. Review Columns 3 and 4 and incorporate all of the corresponding applicable permanent controls and operational BMPs in your WQMP. Use the format shown in Table G.1on page 23 of this WQMP Template. Describe your specific BMPs in an accompanying narrative, and explain any special conditions or situations that required omitting BMPs or substituting alternative BMPs for those shown here.

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ A. **On-site storm drain inlets**	❑ **Locations of inlets.**	❑ **Mark all inlets with the words "Only Rain Down the Storm Drain" or similar. Catch Basin Markers may be available from the Riverside County Flood Control and Water Conservation District, call 951.955.1200 to verify.**	❑ **Maintain and periodically repaint or replace inlet markings.** ❑ **Provide stormwater pollution prevention information to new site owners, lessees, or operators.** ❑ **See applicable operational BMPs in Fact Sheet SC-44, "Drainage System Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** ❑ **Include the following in lease agreements: "Tenant shall not allow anyone to discharge anything to storm drains or to store or deposit materials so as to create a potential discharge to storm drains."**
❑ B. **Interior floor drains and elevator shaft sump pumps**		❑ **State that interior floor drains and elevator shaft sump pumps will be plumbed to sanitary sewer.**	❑ **Inspect and maintain drains to prevent blockages and overflow.**
❑ C. **Interior parking garages**		❑ **State that parking garage floor drains will be plumbed to the sanitary sewer.**	❑ **Inspect and maintain drains to prevent blockages and overflow.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ D1. **Need for future indoor & structural pest control**		❑ **Note building design features that discourage entry of pests.**	❑ **Provide Integrated Pest Management information to owners, lessees, and operators.**
❑ D2. **Landscape/ Outdoor Pesticide Use**	❑ **Show locations of native trees or areas of shrubs and ground cover to be undisturbed and retained.** ❑ **Show self-retaining landscape areas, if any.** ❑ **Show stormwater treatment and hydrograph modification management BMPs. (See instructions in Chapter 3, Step 5 and guidance in Chapter 5.)**	**State that final landscape plans will accomplish all of the following.** ❑ **Preserve existing native trees, shrubs, and ground cover to the maximum extent possible.** ❑ **Design landscaping to minimize irrigation and runoff, to promote surface infiltration where appropriate, and to minimize the use of fertilizers and pesticides that can contribute to stormwater pollution.** ❑ **Where landscaped areas are used to retain or detain stormwater, specify plants that are tolerant of saturated soil conditions.** ❑ **Consider using pest-resistant plants, especially adjacent to hardscape.** ❑ **To insure successful establishment, select plants appropriate to site soils, slopes, climate, sun, wind, rain, land use, air movement, ecological consistency, and plant interactions.**	❑ **Maintain landscaping using minimum or no pesticides.** ❑ **See applicable operational BMPs in "What you should know for…..Landscape and Gardening"** at http://rcflood.org/stormwater/**Error! Hyperlink reference not valid.** ❑ **Provide IPM information to new owners, lessees and operators.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ E. **Pools, spas, ponds, decorative fountains, and other water features.**	❑ **Show location of water feature and a sanitary sewer cleanout in an accessible area within 10 feet. (Exception: Public pools must be plumbed according to County Department of Environmental Health Guidelines.)**	**If the Co-Permittee requires pools to be plumbed to the sanitary sewer, place a note on the plans and state in the narrative that this connection will be made according to local requirements.**	❑ **See applicable operational BMPs in** "Guidelines for Maintaining Your Swimming Pool, Jacuzzi and Garden Fountain" at http://rcflood.org/stormwater/
❑ F. **Food service**	❑ **For restaurants, grocery stores, and other food service operations, show location (indoors or in a covered area outdoors) of a floor sink or other area for cleaning floor mats, containers, and equipment.** ❑ **On the drawing, show a note that this drain will be connected to a grease interceptor before discharging to the sanitary sewer.**	❑ **Describe the location and features of the designated cleaning area.** ❑ **Describe the items to be cleaned in this facility and how it has been sized to insure that the largest items can be accommodated.**	❑ **See the brochure, "**The Food Service Industry Best Management Practices for: Restaurants, Grocery Stores, Delicatessens and Bakeries" at http://rcflood.org/stormwater/ **Provide this brochure to new site owners, lessees, and operators.**
❑ G. **Refuse areas**	❑ **Show where site refuse and recycled materials will be handled and stored for pickup. See local municipal requirements for sizes and other details of refuse areas.** ❑ **If dumpsters or other receptacles are outdoors, show how the designated area will be covered, graded, and paved to prevent run-on and show locations of berms to prevent runoff from the area.** ❑ **Any drains from dumpsters, compactors, and tallow bin areas shall be connected to a grease removal device before discharge to sanitary sewer.**	❑ **State how site refuse will be handled and provide supporting detail to what is shown on plans.** ❑ **State that signs will be posted on or near dumpsters with the words "Do not dump hazardous materials here" or similar.**	❑ **State how the following will be implemented:** **Provide adequate number of receptacles. Inspect receptacles regularly; repair or replace leaky receptacles. Keep receptacles covered. Prohibit/prevent dumping of liquid or hazardous wastes. Post "no hazardous materials" signs. Inspect and pick up litter daily and clean up spills immediately. Keep spill control materials available on-site. See Fact Sheet SC-34, "Waste Handling and Disposal" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ H. **Industrial processes.**	❑ **Show process area.**	❑ **If industrial processes are to be located on site, state: "All process activities to be performed indoors. No processes to drain to exterior or to storm drain system."**	❑ **See Fact Sheet SC-10, "Non-Stormwater Discharges" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com** See the brochure "Industrial & Commercial Facilities Best Management Practices for: Industrial, Commercial Facilities" at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ I. **Outdoor storage of equipment or materials. (See rows J and K for source control measures for vehicle cleaning, repair, and maintenance.)**	❑ **Show any outdoor storage areas, including how materials will be covered. Show how areas will be graded and bermed to prevent run-on or run-off from area.** ❑ **Storage of non-hazardous liquids shall be covered by a roof and/or drain to the sanitary sewer system, and be contained by berms, dikes, liners, or vaults.** ❑ **Storage of hazardous materials and wastes must be in compliance with the local hazardous materials ordinance and a Hazardous Materials Management Plan for the site.**	**Include a detailed description of materials to be stored, storage areas, and structural features to prevent pollutants from entering storm drains.** **Where appropriate, reference documentation of compliance with the requirements of Hazardous Materials Programs for:** ▪ **Hazardous Waste Generation** ▪ **Hazardous Materials Release Response and Inventory** ▪ **California Accidental Release (CalARP)** ▪ **Aboveground Storage Tank** ▪ **Uniform Fire Code Article 80 Section 103(b) & (c) 1991** ▪ **Underground Storage Tank** **www.cchealth.org/groups/hazmat/**	❑ **See the Fact Sheets SC-31, "Outdoor Liquid Container Storage" and SC-33, "Outdoor Storage of Raw Materials " in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ J. **Vehicle and Equipment Cleaning**	❑ **Show on drawings as appropriate:** **(1) Commercial/industrial facilities having vehicle/equipment cleaning needs shall either provide a covered, bermed area for washing activities or discourage vehicle/equipment washing by removing hose bibs and installing signs prohibiting such uses.** **(2) Multi-dwelling complexes shall have a paved, bermed, and covered car wash area (unless car washing is prohibited on-site and hoses are provided with an automatic shut-off to discourage such use).** **(3) Washing areas for cars, vehicles, and equipment shall be paved, designed to prevent run-on to or runoff from the area, and plumbed to drain to the sanitary sewer.** **(4) Commercial car wash facilities shall be designed such that no runoff from the facility is discharged to the storm drain system. Wastewater from the facility shall discharge to the sanitary sewer, or a wastewater reclamation system shall be installed.**	❑ **If a car wash area is not provided, describe any measures taken to discourage on-site car washing and explain how these will be enforced.**	**Describe operational measures to implement the following (if applicable):** ❑ **Washwater from vehicle and equipment washing operations shall not be discharged to the storm drain system.** Refer to "Outdoor Cleaning Activities and Professional Mobile Service Providers" for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/ ❑**Car dealerships and similar may rinse cars with water only.**

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ K. **Vehicle/Equipment Repair and Maintenance**	❑ **Accommodate all vehicle equipment repair and maintenance indoors. Or designate an outdoor work area and design the area to prevent run-on and runoff of stormwater.** ❑ **Show secondary containment for exterior work areas where motor oil, brake fluid, gasoline, diesel fuel, radiator fluid, acid-containing batteries or other hazardous materials or hazardous wastes are used or stored. Drains shall not be installed within the secondary containment areas.** ❑ **Add a note on the plans that states either (1) there are no floor drains, or (2) floor drains are connected to wastewater pretreatment systems prior to discharge to the sanitary sewer and an industrial waste discharge permit will be obtained.**	❑ **State that no vehicle repair or maintenance will be done outdoors, or else describe the required features of the outdoor work area.** ❑ **State that there are no floor drains or if there are floor drains, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.** ❑ **State that there are no tanks, containers or sinks to be used for parts cleaning or rinsing or, if there are, note the agency from which an industrial waste discharge permit will be obtained and that the design meets that agency's requirements.**	**In the Stormwater Control Plan, note that all of the following restrictions apply to use the site:** ❑ **No person shall dispose of, nor permit the disposal, directly or indirectly of vehicle fluids, hazardous materials, or rinsewater from parts cleaning into storm drains.** ❑ **No vehicle fluid removal shall be performed outside a building, nor on asphalt or ground surfaces, whether inside or outside a building, except in such a manner as to ensure that any spilled fluid will be in an area of secondary containment. Leaking vehicle fluids shall be contained or drained from the vehicle immediately.** ❑ **No person shall leave unattended drip parts or other open containers containing vehicle fluid, unless such containers are in use or in an area of secondary containment.** Refer to "Automotive Maintenance & Car Care Best Management Practices for Auto Body Shops, Auto Repair Shops, Car Dealerships, Gas Stations and Fleet Service Operations". Brochure can be found at http://rcflood.org/stormwater/ Refer to Outdoor Cleaning Activities and Professional Mobile Service Providers for many of the Potential Sources of Runoff Pollutants categories below. Brochure can be found at http://rcflood.org/stormwater/

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ L. **Fuel Dispensing Areas**	❑ **Fueling areas[6] shall have impermeable floors (i.e., portland cement concrete or equivalent smooth impervious surface) that are: a) graded at the minimum slope necessary to prevent ponding; and b) separated from the rest of the site by a grade break that prevents run-on of stormwater to the maximum extent practicable.** ❑ **Fueling areas shall be covered by a canopy that extends a minimum of ten feet in each direction from each pump. [Alternative: The fueling area must be covered and the cover's minimum dimensions must be equal to or greater than the area within the grade break or fuel dispensing area[1].] The canopy [or cover] shall not drain onto the fueling area.**		❑ **The property owner shall dry sweep the fueling area routinely.** ❑ **See the Fact Sheet SD-30 , "Fueling Areas" in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

[6] **The fueling area shall be defined as the area extending a minimum of 6.5 feet from the corner of each fuel dispenser or the length at which the hose and nozzle assembly may be operated plus a minimum of one foot, whichever is greater.**

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ M. **Loading Docks**	❑ **Show a preliminary design for the loading dock area, including roofing and drainage. Loading docks shall be covered and/or graded to minimize run-on to and runoff from the loading area. Roof downspouts shall be positioned to direct stormwater away from the loading area. Water from loading dock areas shall be drained to the sanitary sewer, or diverted and collected for ultimate discharge to the sanitary sewer.** ❑ **Loading dock areas draining directly to the sanitary sewer shall be equipped with a spill control valve or equivalent device, which shall be kept closed during periods of operation.** ❑ **Provide a roof overhang over the loading area or install door skirts (cowling) at each bay that enclose the end of the trailer.**		❑ **Move loaded and unloaded items indoors as soon as possible.** ❑ **See Fact Sheet SC-30, "Outdoor Loading and Unloading," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**

S T O R M W A T E R   P O L L U T A N T   S O U R C E S / S O U R C E   C O N T R O L   C H E C K L I S T

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ N. **Fire Sprinkler Test Water**		❑ **Provide a means to drain fire sprinkler test water to the sanitary sewer.**	❑ **See the note in Fact Sheet SC-41, "Building and Grounds Maintenance," in the CASQA Stormwater Quality Handbooks at www.cabmphandbooks.com**
O. **Miscellaneous Drain or Wash Water or Other Sources** ❑ **Boiler drain lines** ❑ **Condensate drain lines** ❑ **Rooftop equipment** ❑ **Drainage sumps** ❑ **Roofing, gutters, and trim.** ❑ **Other sources**		❑ **Boiler drain lines shall be directly or indirectly connected to the sanitary sewer system and may not discharge to the storm drain system.** ❑ **Condensate drain lines may discharge to landscaped areas if the flow is small enough that runoff will not occur. Condensate drain lines may not discharge to the storm drain system.** ❑ **Rooftop equipment with potential to produce pollutants shall be roofed and/or have secondary containment.** ❑ **Any drainage sumps on-site shall feature a sediment sump to reduce the quantity of sediment in pumped water.** ❑ **Avoid roofing, gutters, and trim made of copper or other unprotected metals that may leach into runoff.** ❑ **Include controls for other sources as specified by local reviewer.**	

STORMWATER POLLUTANT SOURCES/SOURCE CONTROL CHECKLIST

IF THESE SOURCES WILL BE ON THE PROJECT SITE ...	... THEN YOUR WQMP SHOULD INCLUDE THESE SOURCE CONTROL BMPs, AS APPLICABLE		
1 Potential Sources of Runoff Pollutants	2 Permanent Controls—Show on WQMP Drawings	3 Permanent Controls—List in WQMP Table and Narrative	4 Operational BMPs—Include in WQMP Table and Narrative
❑ P. **Plazas, sidewalks, and parking lots.**			❑ **Sweep plazas, sidewalks, and parking lots regularly to prevent accumulation of litter and debris. Collect debris from pressure washing to prevent entry into the storm drain system. Collect washwater containing any cleaning agent or degreaser and discharge to the sanitary sewer not to a storm drain.**

Appendix 9: O&M

Operation and Maintenance Plan and Documentation of Finance, Maintenance and Recording Mechanisms

Operation and Maintenance Plan will be done with the Final WQMP and will be based on the final design of the park and associated BMPs.

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

Educational Materials will be provided with the Final WQMP and will be based on the final design of the park and associated BMPs.

Appendix 10: Educational Materials

BMP Fact Sheets, Maintenance Guidelines and Other End-User BMP Information

Educational Materials will be provided with the Final WQMP and will be based on the final design of the park and associated BMPs.

Appendix E

Noise Analysis Letter Report

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HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942
619.462.1515 **tel**
619.462.0552 **fax**
www.**helixepi**.com

December 23, 2019

Mr. Eduardo Sida, MPH
Management Analyst
City of Perris Community Service Department
135 N. D Street
Perris, CA 92570

Subject: Enchanted Hills Park Project – Noise Analysis

Dear Mr. Sida:

HELIX Environmental Planning, Inc. (HELIX) has performed an analysis of noise and vibration impacts related to the construction, operation, and traffic associated with the proposed Enchanted Hills Park Project (project). This letter summarizes the methodology and results of the noise and vibration analysis.

ENVIRONMENTAL SETTING AND PROJECT DESCRIPTION

The project site is located in the western portion of the city of Perris, approximately 300 feet south of Motte Rimrock Reserve. The site is bordered by West Metz Road to the north, Weston Road to the south, and single-family residences to the west and east. Open space is located further to the north and east. The lot is approximately 22 acres in size and is owned by the City. Currently, the site is primarily undeveloped, with the exception of several trails, a bicycle motocross (BMX) course, and other manmade features.

The proposed project involves the construction of a park with a combination of passive and active recreational features. The park would include a multi-use sports field, child play area, toddler play area, restrooms, picnic shelters, hardscape, parking lots, bridges, trails, basketball courts, BMX course improvements, art rocks, splash play, a skating area, an adventure play, and a zip line (refer to Attachment A – Site Plan). The project would retain and incorporate some of the existing site features, including a painted boulder called Owl Rock and the existing BMX course.

FUNDAMENTALS OF NOISE AND VIBRATION

Noise

All noise level or sound level values presented herein are expressed in terms of decibels (dB), with A weighting (dBA) to approximate the hearing sensitivity of humans. Time-averaged noise levels are expressed by the symbol L_{EQ}, with a specified duration.

Sound can be described as the mechanical energy of a vibrating object transmitted by pressure waves through a liquid or gaseous medium (e.g., air) to a hearing organ, such as a human ear. Noise is defined as loud, unexpected, or annoying sound.

In the science of acoustics, the fundamental model consists of a sound (or noise) source, a receiver, and the propagation path between the two. The loudness of the noise source and obstructions or atmospheric factors affecting the propagation path to the receiver contribute to the sound level and characteristics of the noise perceived by the receiver. The field of acoustics deals primarily with the propagation and control of sound.

Continuous sound can be described by frequency (pitch) and amplitude (loudness). A low frequency sound is perceived as low in pitch. Frequency is expressed in terms of cycles per second, or Hertz (Hz) (e.g., a frequency of 250 cycles per second is referred to as 250 Hz). High frequencies are sometimes more conveniently expressed in kilohertz (kHz), or thousands of Hertz. The audible frequency range for humans is generally between 20 Hz and 20,000 Hz.

The amplitude of pressure waves generated by a sound source determines the loudness of that source. A logarithmic scale is used to describe sound pressure level (SPL) in terms of dBA units. The threshold of hearing for the human ear is approximately 0 dBA, which corresponds to 20 micro Pascals (mPa).

Because decibels are logarithmic units, SPL cannot be added or subtracted through ordinary arithmetic. Under the decibel scale, a doubling of sound energy corresponds to a 3 dBA increase. In other words, when two identical sources are each producing sound of the same loudness, the resulting sound level at a given distance would be 3 dBA higher than one source under the same conditions.

Vibration

Vibration is defined as any oscillatory motion induced in a structure or mechanical device as a direct result of some type of input excitation. Sources of ground-borne vibrations include natural phenomena (earthquakes, volcanic eruptions, sea waves, landslides, etc.) or manufactured (explosions, trains, machinery, traffic, construction equipment, etc.). Vibration sources may be transient, steady-state (continuous), or pseudo steady-state. Examples of transient construction vibrations are those that occur from blasting with explosives, impact pile driving, demolition, and wrecking balls.

Ambient and source vibration information are expressed in terms of the peak particle velocity (PPV) in inches per second (in/sec). The root mean square (RMS) of a signal is the average of the squared amplitude of the signal in decibels (relative to 1 micro-in/sec). Because the net average of a vibration signal is zero, the RMS amplitude is used to describe the “smoothed” vibration amplitude. The RMS amplitude is always less than the PPV and is always positive. The RMS average is typically calculated over a one-second period.

The background vibration velocity level in residential areas is usually 50 vibration decibels (VdB) or lower; this is well below the level perceptible by humans, which is approximately 65 VdB. Most perceptible indoor vibration is caused by sources within buildings, such as the operation of mechanical equipment, movement of people, or slamming of doors. Typical outdoor sources of perceptible ground borne vibration are construction equipment, steel-wheeled trains, and traffic on rough roads. If the roadway is smooth, the vibration from traffic is rarely perceptible.

NOISE MODELING SOFTWARE

Modeling of the operational exterior noise environment for this report was accomplished using Computer Aided Noise Abatement (CadnaA) version 2019. CadnaA is a model-based computer program developed by *DataKustik* for predicting noise impacts in a wide variety of conditions. CadnaA assists in the calculation, presentation, assessment, and mitigation of noise exposure. It allows for the input of project-related information, such as noise source data, barriers, structures, and topography to create a detailed CadnaA model, and uses the most up-to-date calculation standards to predict outdoor noise impacts. For the analysis presented herein, operational noise modeling conservatively did not include topographical or other noise attenuation features.

Project construction noise was analyzed using the Roadway Construction Noise Model (RCNM; USDOT 2008), which utilizes estimates of sound levels from standard construction equipment.

EXISTING SENSITIVE LAND USES

Noise sensitive land uses (NSLUs) are land uses that may be subject to stress and/or interference from excessive noise and generally include residences, hospitals, schools, hotels, resorts, libraries, sensitive wildlife habitat, or similar facilities where quiet is an important attribute of the environment. NSLUs in the project vicinity include the residential land uses located across West Metz Road to the north, across Weston Road to the south, and adjacent to the project boundaries on the east and west.

EXISTING NOISE SETTING

The proposed project site is in an area surrounded by residential and open space land uses, and existing noise levels are relatively low. Noise sources in the immediate vicinity of the project site include residential traffic from West Metz Road, Altura Drive, Weston Road, and Carter Drive, in addition to occasional overhead aircraft associated with Perris Valley Airport-L65, which is located 2.5 miles to the southeast, and March Air Reserve Base, which is located 5 miles to the north.

NOISE REGULATIONS

Construction Noise

The City's Municipal Code Chapter 7.34.060 (Construction noise) prohibits construction between the hours of 7:00 p.m. and 7:00 a.m. and on Sundays and legal holidays, with the exception of Columbus Day and Presidents' Day. Additionally, construction noise levels are limited to 80 dBA in residential zones in the City.

Operational Noise

The City's Municipal Code Chapter 7.34.050 (General prohibition) limits exterior noise levels at residential properties to a maximum noise level (L_{MAX}) of 80 dBA L_{MAX} from 7:01 a.m. to 10:00 p.m. and 60 dBA L_{MAX} from 10:01 p.m. to 7:00 a.m. A maximum noise level limit is not the most appropriate metric to use in the analysis for the project because operation of the park would generate noise levels that would continuously fluctuate over time. The noise level metric appropriate to use in this analysis is a time-averaged noise level (L_{EQ}). Therefore, this analysis incorporates residential land use noise standards from the County of Riverside General Plan Noise Element, which utilize an L_{EQ} metric. These standards are shown in Table 1, *Stationary Source Residential Land Use Standards*.

Table 1
STATIONARY SOURCE RESIDENTIAL LAND USE STANDARDS

Time Period	Standard (dBA L_{EQ} [10 minute])	
	Interior	Exterior
10:00 p.m. to 7:00 a.m.	40	45
7:00 a.m. to 10:00 p.m.	55	65

Source: Riverside County 2015

ANALYSIS AND IMPACTS

Construction Noise Levels

Construction of the proposed project is anticipated to involve rock clearing/breaking, grading, facilities construction, and paving. The magnitude of the impact would depend on the type of construction activity, equipment, duration of each construction phase, distance between the noise source and receiver, and intervening structures. Construction would generate elevated noise levels that may be audible at nearby residential uses in the vicinity of the project site.

Construction equipment would not all operate at the same time or location. Furthermore, construction equipment would not be in constant use during the 12-hour operating day. Table 2, *Construction Equipment Noise Levels*, provides the 50-foot distance noise levels for commonly used construction equipment.

Table 2
CONSTRUCTION EQUIPMENT NOISE LEVELS

Unit	Percent Operating Time	dBA L_{MAX} at 50 feet	dBA L_{EQ} at 50 feet
Backhoe	40	77.6	73.6
Breaker	20	90.3	80.3
Compactor	20	83.2	76.2
Compressor	40	77.7	73.7
Concrete Mixer Truck	40	78.8	74.8
Concrete Pump Truck	20	81.4	74.4
Dump Truck	50	76.5	72.5
Drum Mixer	40	80.0	77.0
Medium Excavator	40	78.0	74.0
Large Excavator	40	80.7	76.7
Front-End Loader	40	79.1	75.1
Grader	40	85.0	81.0
Paver	50	77.2	74.2
Roller	20	80.0	73.0

Source: USDOT 2008

It is anticipated that rock breaking and subsequent rock removal would be required for the proposed project to remove boulders from areas prior to grading. Rock breaking, if necessary, would likely be achieved via an excavator-mounted breaker. The use of this equipment would occur at variable locations across the site, based on the locations of individual rocks that need to be broken prior to removal. Because the exact locations of this activity are unknown, a setback distance is provided for planning purposes. Assuming a 10 percent hourly operating time, a breaker used within 50 feet of a residence would generate noise levels above 80 dBA.

Grading would be required throughout various portions of the site, including the locations of the proposed parking lots and multi-use field. A grader would be used and, due to its mobile nature, would operate at an average distance of approximately 200 feet from the nearest residences over the course of a workday. Assuming a 40 percent hourly operating time, a grader would generate a noise level of 69.0 dBA L_{EQ} at 200 feet.

Construction of the proposed facilities, including the play areas, restrooms, picnic shelters, and splash play, would occur at various locations throughout the site. A loader/backhoe would likely be used in construction for each of the listed facilities. The facility anticipated to require the use of a loader/backhoe that is closest to off-site residences is the picnic shelter in the northern portion of the site, which is located 190 from the residences to the north. Assuming a 40 percent hourly operating time, the use of a loader/backhoe would generate a noise level of 62.0 dBA L_{EQ} at 190 feet.

Paving would be required at the locations of the proposed parking lots. A roller and then a paver would likely be used and, due to their mobile nature, would operate at an average distance of approximately 200 feet from the nearest residences over the course of a workday. Assuming a 20 percent hourly operating time for a roller and a 50 percent hourly operating time for a paver, a roller would generate a noise level of 61.0 dBA L_{EQ} and a paver would generate a noise level of 62.2 dBA L_{EQ} at a distance of 200 feet.

The City's Municipal Code Chapter 7.34.060 prohibits construction between the hours of 7:00 p.m. and 7:00 a.m. and on Sundays and legal holidays, with the exception of Columbus Day and Presidents' Day. Additionally, construction noise levels are limited to 80 dBA in residential zones in the city. Project-related construction activities would only occur within the hours specified in the City's Municipal Code, and grading, construction, and paving activities would not exceed the 80-dBA limit in residential zones in the city. However, since rock breaking may occur within 50 feet of residences, the proposed project could result in a violation of the City's construction noise standard. Construction noise impacts would be potentially significant, and mitigation measure NOI-1, detailed below, would be required.

Construction Vibration

The primary source of vibration during project construction would be a vibratory roller (primarily used in areas that would be paved). Due to its mobile nature, the use of a vibratory roller during construction would occur at an average distance of 200 feet from the nearest off-site residential land uses. A vibratory roller creates approximately 0.21 in/sec PPV at a distance of 25 feet. At a distance of 200 feet, a vibratory roller would create a PPV of 0.02 in/sec[1]. This would be below the distinctly perceptible

[1] Equipment PPV = Reference PPV * $(25/D)^n$(in/sec), where Reference PPV is PPV at 25 feet, D is distance from equipment to the receptor in feet, and n= 1.1 (the value related to the attenuation rate through the ground); formula from Caltrans 2013.

vibration annoyance potential criteria of 0.04 in/sec PPV as provided in the California Department of Transportation's (Caltrans') Transportation and Construction Vibration Guidance Manual (Caltrans 2013) for continuous/frequent intermittent sources. Though vibration levels may be perceptible to people at nearby land uses, the levels would be low and would occur for short periods of time. As such, vibration impacts to humans would be less than significant.

Operational Noise Levels

The proposed project would include a variety of uses throughout the site that would produce noise. Generally, these uses would be associated with daytime recreation activities and would not generate high levels of noise. In addition, a substantial amount of noise generated on site would not be audible due to the large area of the site and distance from the noise sources to off-site receivers.

Of the project's various proposed park uses, the primary noise-generating uses would include the multi-use sports field, child play area, splash play, and basketball courts. Noise associated with these four uses are discussed in the following sections.

Multi-use Sports Field

The proposed multi-use sports field would be located in the northern half of the park. The field is anticipated to host both organized and unorganized sporting events. For organized sporting events, public address systems would not be used unless a permit is obtained from the City, and noise associated with public address systems is not analyzed herein. At its closest point, the field would be approximately 110 feet from the nearest residential property line to the west. For analysis purposes, however, the various noise sources, including players, coaches, referees, and cheering spectators, are assumed to be located at an average distance of 300 feet from the nearest property line because these noise sources would be located across the entire field area and not just at the portion closest to the residences.

For a previous project (HELIX 2019), HELIX conducted a site visit at a sports field to assess crowd noise levels from a sporting event similar to an event that may be held at the proposed multi-use field. No public address systems were in use at the fields during the site visit. Noise from spectators, coaches, and referees blowing whistles generated most of the noise. During a 15-minute measurement period when multiple matches were in play, a noise level of 61.2 dBA L_{EQ} (15-minute) was measured at a distance of 200 feet from the center of the crowd, which was estimated to consist of approximately 300 people.

Because the noise sources associated with the proposed multi-use sports field are anticipated to be located at an average distance of approximately 300 feet from the nearest property line, noise levels at the receivers can be assumed to be less than 61.2 dBA L_{EQ}, and would therefore be below the 65-dBA L_{EQ} daytime exterior noise level threshold used for this analysis. In addition, it is unlikely that the proposed multi-use sports field, as part of a neighborhood park, would host organized sporting events with as many as 300 people.

Child Play Area and Splash Play

The project proposes a child play area and a splash play in the southern half of the site, at distances of approximately 170 feet and 320 feet, respectively, from the nearest residential property lines. Both the child play area and splash play would accommodate playing children who would generate noise. While exact noise planning is not feasible for these two play areas due to a lack of specific numbers and utilization (e.g., what kind of games will be played, how many children will be participating), it is reasonably assumed for this analysis, based on the size of the child play area and splash play, as well as HELIX's experience with similar type projects (HELIX 2016), that 30 children would be present at both the child play area and splash play at a given time, resulting in 30 individually distributed noise sources at each location. Based on these assumptions, the child play area is estimated to generate a noise level of 49.3 dBA L_{EQ} at the site's southern property line (a distance of 170 feet) and the splash play is estimated to generate a noise level of 43.7 dBA L_{EQ} at the site's eastern property line (a distance of 320 feet). Noise levels from these two project components would be below the 65-dBA L_{EQ} daytime exterior noise level threshold used for this analysis.

Basketball Court

The project proposes two basketball courts, one in the center of the site and one near the northern end of the site. Noise from the court at the northern end of the site is analyzed herein, as this court is closer to a residential property line, at an approximate distance of 100 feet from the northern property line.

The sound of a basketball hitting the backboard of a basketball hoop would typically have a maximum noise level of less than 85 dBA at about 5 feet and a duration of less than 0.2 second. A single event of a ball hitting the backboard, averaged over the duration of an hour, would be approximately 42.4 dBA L_{EQ} at 5 feet, 22.4 dBA L_{EQ} at 50 feet, and 16.4 dBA L_{EQ} at 100 feet (HELIX 2017).

The number of backboard hits in a recreational basketball game would vary. A reasonable assumption is based on a professional basketball game, which averages approximately 180 shots attempted per the standard 48-minute game (Teamrankings.com 2019), which equates to approximately 225 shots per hour. Because recreational basketball games are generally less organized and faster-paced than professional basketball games, this analysis assumes 300 backboard hits per hour. With 300 backboard hits per hour, the proposed basketball court would generate a noise level of 41.8 dBA L_{EQ} at the project site's northern property line, which would be below the 65-dBA L_{EQ} daytime exterior noise level threshold used for this analysis.

Traffic Noise Levels

The project is estimated to generate 90 daily trips, with 19 trips during the peak hour, on weekdays and 450 daily trips, with 46 trips during the peak hour, on Saturdays (Urban Crossroads 2019). Due to the low levels of vehicular traffic, noise levels are not anticipated to substantially increase noise levels at residences along local roadways in the vicinity of the project site. In addition, because the project includes two entrances, one on each end of the park site, not all vehicular traffic would travel along the same roadways.

MITIGATION

The following mitigation measure would reduce construction noise impacts associated with rock breaking to a less-than-significant level:

NOI-1 **Rock Breaking Restrictions.** Noise generated during construction activities, including rock breaking, shall not exceed 80 dBA L_{EQ} (one hour) at off-site residential properties. Since rock breaking within 50 feet of residential properties would exceed 80 dBA, no rock breaking within 50 feet of residential properties shall occur.

CONCLUSIONS

With implementation of mitigation measure NOI-1, impacts related to the proposed project's construction and operational noise would be less than significant.

We appreciate the opportunity to work with you on this project. Please let me know if you have any questions or require any further information.

Regards,

Hunter Stapp

Hunter Stapp
Noise Analyst

Charles Terry
Principal Specialist
Noise, Acoustics & Vibration

Attachments:

Attachment A – Site Plan

REFERENCES

California Department of Transportation (Caltrans). 2013. Transportation and Construction Vibration Guidance Manual. September.

HELIX Environmental Planning, Inc. (HELIX). 2019. Acoustical Analysis Report for the 3Roots San Diego Project. June.

2017. Noise Technical Report for the La Colonia Skate Park Project. December.

2016. Acoustical Site Assessment Report for the Bub Williamson Park Project. July.

Riverside County. 2015. Noise Element. County of Riverside General Plan. December 8.

Teamrankings.com. 2019. NBA Team Field Goals Attempted per Game. Available from: https://www.teamrankings.com/nba/stat/field-goals-attempted-per-game.

Urban Crossroads. 2019. Enchanted Hills Park Focused Traffic Assessment. December 13.

U.S. Department of Transportation (USDOT). 2008. Roadway Construction Noise Model (RCNM).

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Appendix F

Focused Traffic Assessment

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URBAN CROSSROADS
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urbanxroads.com

December 13, 2019

Ms. Kara Palm
HELIX Environmental Planning, Inc.
7578 El Cajon Boulevard
La Mesa, CA 91942

SUBJECT: ENCHANTED HILLS PARK FOCUSED TRAFFIC ASSESSMENT

Dear Ms. Kara Palm:

The firm of Urban Crossroads, Inc. is pleased to submit the following Focused Traffic Assessment for the proposed Enchanted Hills Park development (referred to as "Project"), which is located north of Weston Road and on either side of Diana Street, in the City of Perris. This report focuses on trip generation assessment and qualitative evaluation of pedestrian and bicycle connectivity in the vicinity of the Project. The preliminary site plan is shown on Exhibit 1. The Project is anticipated to be constructed by the year 2022.

PROJECT DESCRIPTION

The approximately 22-acre Project site, which is located in the Enchanted Hills area of Perris, is bound by Metz Road on the north, Watson Road on the south, and residential homes that front Altura Drive to the east and Carter Drive to the west. The Enchanted Hills area was recognized as a park-deficient community and subsequently, the City was awarded funds through California Department of Housing and Community Development to assist in the acquisition of parcels to create a park. Currently, the City is in the process of applying for a Proposition 68 – Statewide Park Development and Community Revitalization Program grant to construct the park. Additionally, the Project site, which is located in what the City's General Plan designates as Planning Area 7 notes that there is a need for active parkland and sports fields for use by residents in this area.

Through a series of community outreach efforts, the City prepared a conceptual plan for the Project. The plan includes a combination of passive and active recreational features including a multi-use field, child play area, tot play area, half-court basketball courts, BMX course improvements, splash play area, skate spot, zip line, trails and bridges, restroom buildings picnic shelters, art rocks, hardscape area, and parking. Additionally, the Project would retain and incorporate with improvements some of the existing site features, such as Owl Rock, which is a painted boulder and as noted the existing BMX course that has been constructed on the Project site by local neighbors. The conceptual plan also identifies a detention basin near the Weston Road Project entrance. There are three entrances to the site; one at the intersection of Weston Road and Diana Street and two entrances that form a horse-shoe drive adjacent to and accessible from Metz Road.

Currently the Project site is largely undeveloped; however, there are several trails, the BMX course, and other signs of disturbance and man-made features. Site topography is relatively flat with a slight slope from the north to the south. While many natural features of the site would be retained, park development would include the introduction of hardscape and impermeable surfaces as well as turfed and landscaped areas.

PROJECT TRIP GENERATION

Trip generation represents the amount of traffic that is attracted and produced by a development, and is based upon the specific land uses planned for a given project. Trip generation rates (actual vehicles) for the Project are shown in Table 4-1 illustrating daily and peak hour trip generation estimates based on the Institute of Transportation Engineers (ITE) Trip Generation Manual, 10th Edition, 2017, for ITE land use code 411 (Public Park) and ITE land use code 488 (Soccer Complex) has been used to derive site specific trip generation estimates.

As shown in Table 1, the Project is anticipated to generate a net total of 90 weekday vehicle trip-ends per day, which includes 1 AM peak hour trips, 19 PM peak hour trips. The Project is anticipated to generate approximately 450 vehicle trip-ends per day on a Saturday which includes 46 peak hour trips.

Due to the relatively low traffic volume (below 50 peak hour trips) associated with the operations of the Project, additional analysis of potential off-site traffic impacts is not required.

TABLE 1: PROJECT TRIP GENERATION SUMMARY

Land Use	LU Code	Units[1]	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour			Saturday
			In	Out	Total	In	Out	Total	Daily	In	Out	Total	Daily
Trip Generation Rates[2]													
Public Park	411	AC	0.01	0.01	0.02	0.06	0.05	0.11	0.78	0.15	0.13	0.28	1.96
Soccer Complex	488	Fields	0.60	0.39	0.99	10.84	5.59	16.43	71.33	19.25	20.85	40.10	404.88

Land Use	Quantity	Units[1]	AM Peak Hour			PM Peak Hour			Weekday	Saturday Peak Hour			Saturday
			In	Out	Total	In	Out	Total	Daily	In	Out	Total	Daily
Trip Generation Summary													
Public Park	22.0	AC	0	0	0	1	1	2	18	3	3	6	44
Soccer Complex	1	Fields	1	0	1	11	6	17	72	19	21	40	406
		Total	**1**	**0**	**1**	**12**	**7**	**19**	**90**	**22**	**24**	**46**	**450**

[1] AC = Acres
[2] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 10th Edition (2017).

PROJECT ACCESS

Access to the Project site will be provided to both Weston Road and Metz Road via the following driveways:

1. Weston Road via Diana Street/Driveway
2. Metz Road via Driveway

TRANSIT SERVICE

The study area is currently served by the Riverside Transit Authority (RTA), a public transit agency serving the unincorporated Riverside County region. As shown on Exhibit 2, RTA Routes 22 and 30 are bus routes that currently serve the roadways in close proximity to the proposed Project.

Transit service is reviewed and updated by RTA periodically to address ridership, budget and community demand needs. Changes in land use can affect these periodic adjustments which may lead to either enhanced or reduced service where appropriate. If the RTA has future plans for the establishment of a bus route that will serve the project area, road improvements adjacent to the project site shall be designed to accommodate future bus turnouts at locations established through consultation with the RTA.

BICYCLE & PEDESTRIAN FACILITIES

In an effort to promote alternative modes of transportation, the City of Perris also includes a proposed bikeways and trail system. The City of Perris proposed bikeways and trail system is shown on Exhibit 3. Lukens Lane and San Jacinto Avenue are proposed to have Class II bike lanes. Exhibit 4 illustrates the existing bicycle and pedestrian facilities, including sidewalks and crosswalk locations.

ON-SITE ROADWAY AND SITE ACCESS IMPROVEMENTS

The recommended site-adjacent roadway improvements for the Project are described below. Exhibit 5 illustrates the site-adjacent roadway improvement recommendations.

Weston Road and Metz Road are east-west oriented roadways located along the Project's northern and southern boundary. Weston Road and Metz Road are currently constructed at its ultimate full-section width as a local street along the Project's northern and southern boundary consistent with the City of Perris General Plan Circulation Element. The Project Applicant would improve Weston Road and Metz Road as required by the final Conditions of Approval for the Project and applicable City of Perris standards.

On-site traffic signing and striping should be implemented in conjunction with detailed construction plans for the Project site.

Sight distance at each project access point should be reviewed with respect to standard Caltrans and City of Perris sight distance standards at the time of preparation of final grading, landscape and street improvement plans.

If you have any questions, please contact me directly at (949) 336-5992.

Respectfully submitted,

URBAN CROSSROADS, INC.

Pranesh Tarikere, PE
Senior Engineer

Table 1

Project Trip Generation Summary

Land Use	LU Code	Units[1]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Weekday Daily	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total	Saturday Daily
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Public Park	411	AC	0.01	0.01	0.02	0.06	0.05	0.11	0.78	0.15	0.13	0.28	1.96
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Land Use	Quantity	Units[1]	AM Peak Hour In	AM Peak Hour Out	AM Peak Hour Total	PM Peak Hour In	PM Peak Hour Out	PM Peak Hour Total	Weekday Daily	Saturday Peak Hour In	Saturday Peak Hour Out	Saturday Peak Hour Total	Saturday Daily
Trip Generation Summary													
Public Park	22.0	AC	0	0	0	1	1	2	18	3	3	6	44
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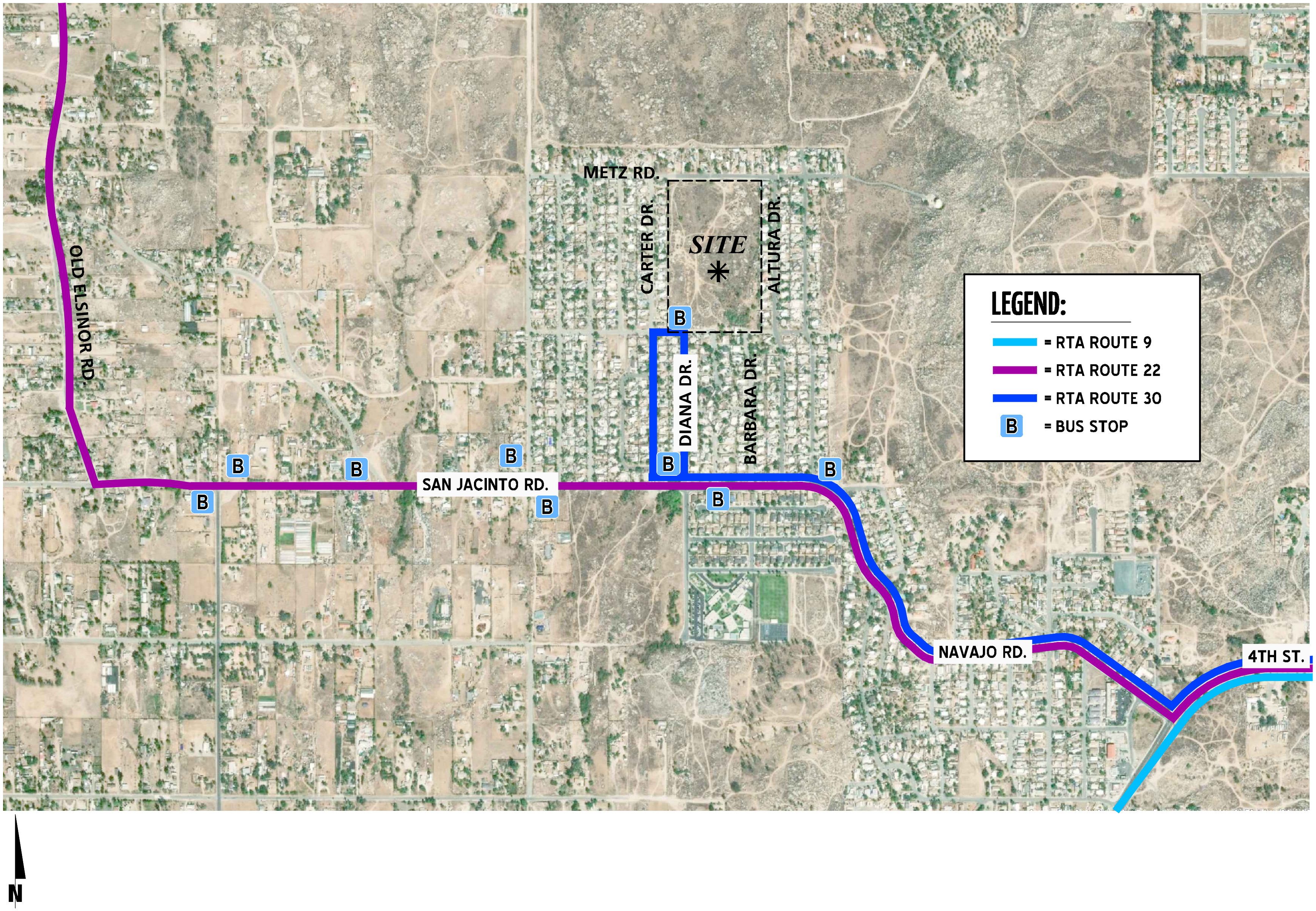
		Total	**1**	**0**	**1**	**12**	**7**	**19**	**90**	**22**	**24**	**46**	**450**

[1] AC = Acres

[2] Trip Generation Source: Institute of Transportation Engineers (ITE), Trip Generation Manual, 10th Edition (2017).

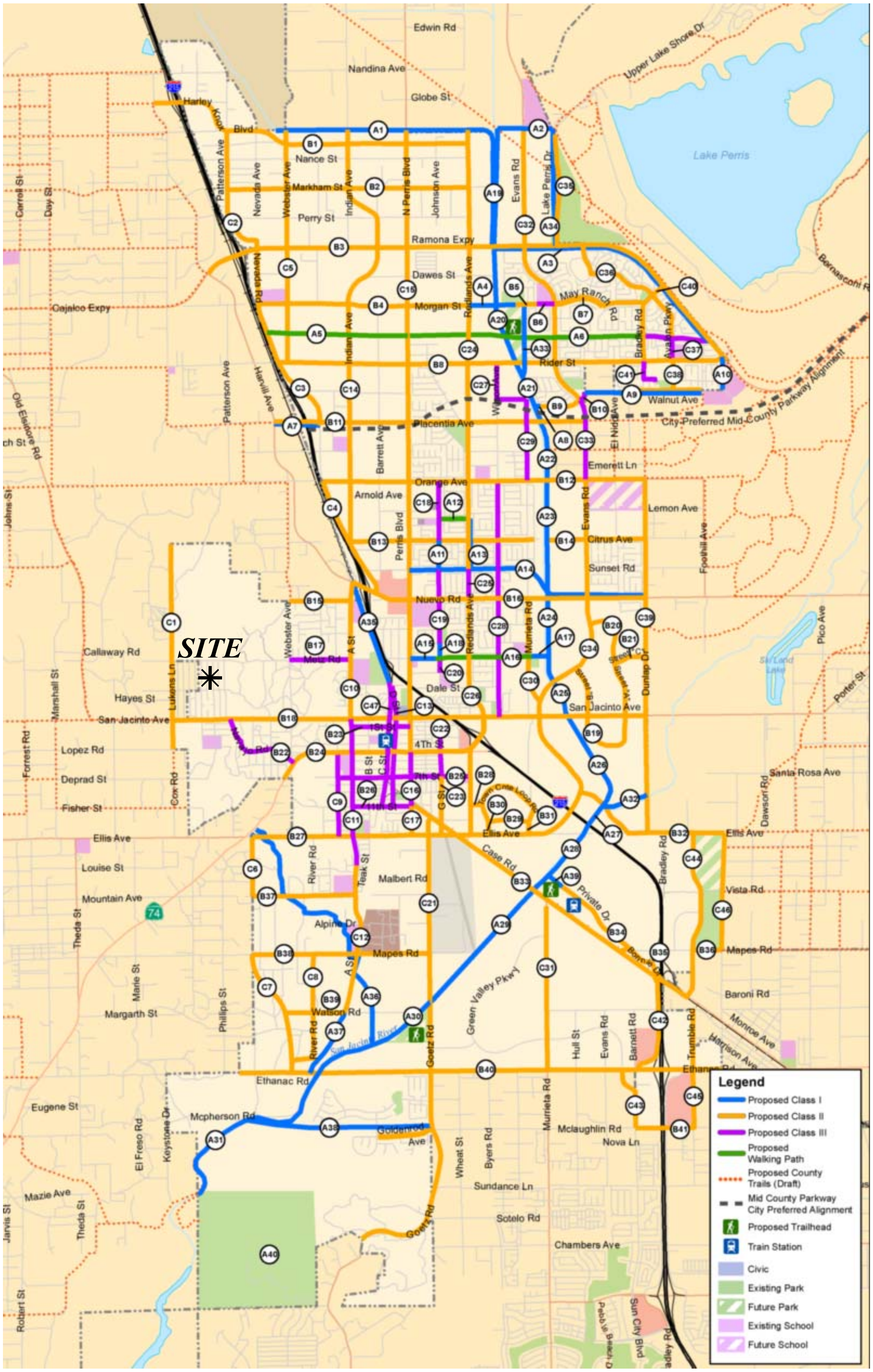
EXHIBIT 1: PRELIMINARY SITE PLAN

EXHIBIT 2: EXISTING TRANSIT ROUTES



URBAN CROSSROADS

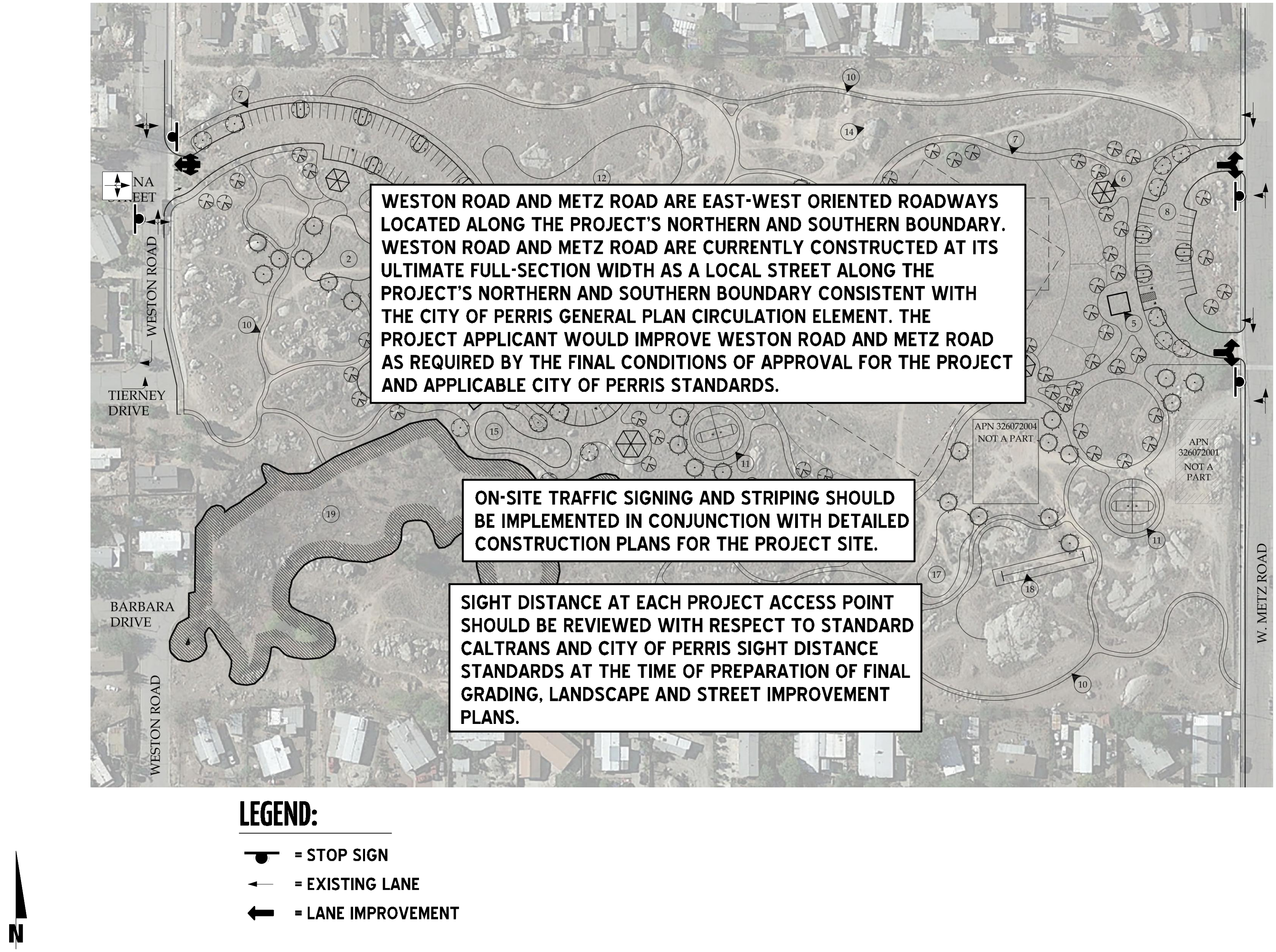
EXHIBIT 3: CITY OF PERRIS PROPOSED BIKEWAYS AND TRAIL IMPROVEMENTS



SOURCE: CITY OF PERRIS (FEBRUARY 20, 2015)

EXHIBIT 4: EXISTING PEDESTRIAN FACILITIES

EXHIBIT 5: SITE ADJACENT ROADWAY AND SITE ACCESS RECOMMENDATIONS



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